

*copy 2*  
RESCINDED Per DA *param 310-1*  
*Dec 1985*

**C. 2**  
**FM 55-14**

**FIELD MANUAL**

**AIR TRANSPORT OF SUPPLIES**

**AND EQUIPMENT:**

**UH-1 HELICOPTER IN AIR FORCE AIRCRAFT**

RETURN TO THE ARMY LIBRARY  
ROOM 1A710 PENTAGON  
WASHINGTON, D. C. 20310

**HEADQUARTERS, DEPARTMENT OF THE ARMY**

**OCTOBER, 1974**



FIELD MANUAL

No. 55-14

RESCINDED Per DA

pam 310-1  
Dec 1985HEADQUARTERS  
DEPARTMENT OF THE ARMY  
WASHINGTON, D. C., 10 October 1974

## AIR TRANSPORT OF SUPPLIES AND EQUIPMENT:

## UH-1 HELICOPTER IN AIR FORCE AIRCRAFT

| CHAPTER  |                                                   | Paragraph | Page |
|----------|---------------------------------------------------|-----------|------|
| 1.       | INTRODUCTION                                      |           |      |
|          | Purpose and scope                                 | 1-1       | 1    |
|          | Comments on the manual                            | 1-2       | 1    |
| 2.       | GENERAL                                           |           |      |
|          | Reference to TM 55-450-15                         | 2-1       | 2    |
|          | Responsibility of the airplane crew               | 2-2       | 2    |
|          | Responsibility of the Army loading unit           | 2-3       | 2    |
|          | Maximum loads                                     | 2-4       | 2    |
|          | Loading/unloading teams                           | 2-5       | 2    |
|          | Personnel and time requirements                   | 2-6       | 2    |
|          | General instructions for preparing the helicopter | 2-7       | 3    |
|          | Ground handling wheels                            | 2-8       | 5    |
|          | Towing bridle                                     | 2-9       | 6    |
|          | Ramp extensions                                   | 2-10      | 8    |
|          | Control of the tail boom during loading           | 2-11      | 9    |
|          | Blocking under the skids for tie down             | 2-12      | 10   |
|          | Tiedown diagrams                                  | 2-13      | 11   |
| 3.       | TRANSPORT IN C-130 AIRPLANE                       |           |      |
|          | General                                           | 3-1       | 12   |
|          | Preparation                                       | 3-2       | 12   |
|          | Loading                                           | 3-3       | 12   |
|          | Tie down                                          | 3-4       | 13   |
|          | Unloading                                         | 3-5       | 13   |
| 4.       | TRANSPORT IN C-141 AIRPLANE                       |           |      |
|          | General                                           | 4-1       | 14   |
|          | Preparation                                       | 4-2       | 14   |
|          | Loading                                           | 4-3       | 15   |
|          | Tie down                                          | 4-4       | 15   |
|          | Unloading                                         | 4-5       | 18   |
| 5.       | TRANSPORT IN C-5 AIRPLANE                         |           |      |
|          | General                                           | 5-1       | 19   |
|          | Preparation                                       | 5-2       | 19   |
|          | Loading                                           | 5-3       | 20   |
|          | Tie down                                          | 5-4       | 21   |
|          | Unloading                                         | 5-5       | 26   |
| APPENDIX | A. REFERENCES                                     |           | 27   |
|          | B. RAMP EXTENSIONS                                |           | 28   |



# CHAPTER 1

## INTRODUCTION

---

### 1-1. Purpose and Scope

This manual furnishes technical instructions required to prepare, load, tie down, and unload UH-1 helicopters transported in Air Force C-130, C-141, and C-5 airplanes for unit movement and rapid deployment at destination. This includes information on materials, personnel, and times required to perform the various operations. Refer to the TM 1-UH-1-S for logistical (depot or terminal) shipment of the UH-1 helicopter.

### 1-2. Comments on the Manual

Users of this manual are encouraged to submit

recommended changes or comments for its improvement. Comments and recommended changes should be keyed to the specific page, paragraph, and line for which the change is recommended. Reasons should be provided for each comment or recommended change to insure complete understanding and evaluation. Comments and recommended changes should be prepared on DA Form 2028 (Recommended Changes to Publications and Blank Forms) and be forwarded direct to the Commandant, US Army Transportation School. ATTN: ATSP-CTD-OT, Fort Eustis, Virginia 23604.

## CHAPTER 2

### GENERAL

#### 2-1. Reference to TM 55-450-15

It is recommended that the general instructions in TM 55-450-15 and FM 55-12 be reviewed prior to planning any of the loads shown in these manuals. These manuals provide information on the principles, procedures, techniques, materials, and equipment needed for load planning, loading, tying down, and unloading Army materiel moved by Air Force transport aircraft. They also include descriptions of the transport characteristics and capabilities of those aircraft and the tiedown equipment used for restraining the cargo.

#### 2-2. Responsibility of the Airplane Crew

a. The Air Force airplane commander is charged with deciding when his aircraft is safe to fly. Thus, the final determination of airplane balance and cargo restraint rests with the airplane crew.

b. In unit moves, helicopters are loaded, tied down, and unloaded by the Army personnel with technical advice and assistance provided by the Air Force personnel.

c. Air Force personnel can be expected to perform the following functions:

(1) Advising and assisting the Army loading teams.

(2) Preparing the airplane for loading and unloading the helicopter.

(3) Rigging and operating the loading aids organic to the airplane.

(4) Designating the helicopter tiedown location in the airplane.

(5) Determining restraint requirements.

(6) Furnishing tiedown devices.

(7) Inspecting correctness of tiedown.

d. Air Force personnel cannot be expected to perform the following functions:

(1) Loading, tying down, or unloading the helicopter.

(2) Furnishing lumber or other materials for shoring, blocking, or ramp extensions.

#### 2-3. Responsibility of the Army Loading Unit

a. The Army loading unit is responsible for the following:

(1) Preparing the helicopter for transport.

(2) Marking the helicopter's weight and center of gravity (CG) on the helicopter.

(3) Loading, tying down, and unloading the helicopter.

(4) Furnishing lumber, plywood, and other materials needed for shoring, blocking, and the ramp extensions.

(5) Laying the shoring and constructing a ramp extension (fig 2-2 and app B).

b. A conference with Air Force personnel should be held prior to the loading operation to resolve problems and coordinate loading plans.

#### 2-4. Maximum Loads

Figures 3-1, 4-1, and 5-1 show the maximum number of helicopters which can be loaded into C-130, C-141, and C-5 airplanes, respectively, without removing the helicopter tail booms. Figure 4-1 also shows a maximum three-helicopter load for the C-141 if the tail booms are removed. Figures 3-1 and 4-1 show the direction the helicopter(s) must face for any load, and how they are fitted into the cargo compartments.

#### 2-5. Loading/ Unloading Teams

a. A loading team usually consists of seven men for the C-130 and C-141 and eight men for the C-5, including a supervisor (chief). Two men are stationed ahead of the helicopter to act as guides and four men at the tail end to control the tail boom as the helicopter is winched into the airplane. When loading or unloading the helicopter into or from the C-5, a man is stationed on top of the helicopter at the rotor mast to observe overhead clearance (fig 5-2).

b. The entire loading team helps to build or emplace the ramp extension, make the towing bridle, and lay plywood or planking along the treadways in preparation for moving the helicopter up the ramp. After these preliminary tasks have been completed, each man should go to his loading station.

c. The loading team blocks up the helicopter for tie down and ties down the helicopter under supervision of the airplane loadmaster.

#### 2-6. Personnel and Time Requirements

The following may be used for broad general guidance in determining personnel and times required in preparing, loading, unloading, and reassembling the helicopter. Times can be expected to vary in accordance with the skill of the personnel, availability of processing and handling materiel, and weather conditions.

a. Preparation.

(1) Tail booms not removed. Placing of

shoring/lumber for airplane and ramp, disassembly of helicopter, packaging of components, and tie down inside of helicopter: seven men, 1½ hours.

(2) *Tail booms removed.* Placing of shoring/lumber for airplane and ramp, disassembly of helicopter, packaging of components, and tie down inside of helicopter: seven men, 2½ hours.

b. *Loading.* Placing helicopter and components into the airplane: seven men, ½ hour.

c. *Tie Down.* Restraining helicopter and components in the airplane: seven men, ½ hour.

d. *Unloading.* Removing helicopter and components from the airplane: seven men, ½ hour.

e. *Reassembly.*

(1) *Tail booms not removed.* Seven men, 3 hours.

(2) *Tail booms removed.* Seven men, 4½ hours.

## 2-7. General Instructions for Preparing the Helicopter

a. Preparing the helicopter involves removing parts to reduce the size. Specific directions are given for each transporting airplane as to which components must be removed in preparing the helicopter for shipment.

**Caution:** Removal of helicopter components may expose other components which may be susceptible to damage or deterioration from such exposure. For instance, if dirt or water should gain entrance or make contact, they can cause corrosion or abrasion to the unprotected parts. Exposed elements or areas should be adequately covered, wrapped, padded, or otherwise protected. The same action should be taken when preparing and packaging removed components for stowage and tie down. For example, if the mast and swashplate are packaged as one component, wood wedge chocks should be placed between them to prevent movement and possible damage.

**Note.** To reduce congestion in the vicinity of the airplane, preparations should be completed before taking the helicopter to the loading site.

b. Except for the main rotor blades, all parts removed from the helicopter can be loaded inside the helicopter. Parts should be wrapped in a protective cushioning material and tied down with suitable tiedown devices to meet restraint requirements to keep them from shifting during flight.

c. No loading plan is prescribed for stowing parts in the helicopter. Parts should be distributed to center the weight of the load over

the ground handling wheels to make it easier to manhandle the helicopter.

d. It is preferable to stow the main rotor blades in blade boxes or improvised racks which can be set on the floor of the airplane.

(1) Rotor blades transported in blade boxes are relatively safe from damage because the boxes are specifically designed to keep the blades from shifting. However, since blade boxes are too large to be stowed underneath the helicopter, their use reduces the amount of aircraft space available for loading helicopters, or other cargo. This is true, also, of blade racks in which the rotor blades are stowed edge-up, instead of flat.

(2) When neither blade boxes nor racks are used, the blades can be placed on mattresses or some suitable cushioning material laid on the floor of the airplane. Precaution must be taken to use material that is not oil-soaked or contains abrasives which could damage the blade when pressure is applied when tying it down.

e. The helicopter should be prepared in the following order:

(1) Remove items specified in the appropriate chapter.

(2) Stow and secure components (except main rotor blades) inside the helicopter.

(3) Determine the center of gravity of the helicopter and mark on the fuselage.

(4) Install the ground handling wheels (para 2-8).

f. The following data relates to the helicopter read-for-loading:

|                                                    | UH-1B  | UH-1C M | UH-1D H |
|----------------------------------------------------|--------|---------|---------|
| Length (after disassembly)                         | 39' 8" | 39' 8"  | 41' 8"  |
| Width:                                             |        |         |         |
| At skid tubes                                      | 8' 5"  | 8' 5"   | 8' 5"   |
| With ground handling wheels                        | 10' 7" | 10' 7"  | 10' 7"  |
| Height (after disassembly):                        |        |         |         |
| At top of cyclic control tubes                     | 8' 3"  | 8' 8" + | 9' +    |
| At tail rotor hub                                  | 10' 4" | 10' 4"  | 10' 2"  |
| Empty weight (less fuel oil, and armament), pounds | 4,471  | 5,150 + | 4,920   |

**Caution:** The data in the above table is for general guidance only. It provides a check for data the loading unit must obtain by actually measuring and weighing the helicopter.

g. Since clearance at the loading door of the C-141 is critical, it is recommended that the cyclic control rods of the UH-1D/H helicopters be lowered during preparation of the helicopter. The procedure for this is not found in the applicable maintenance manual, therefore it is given below. Use figures 2-1 and 2-2 and the following instructions:

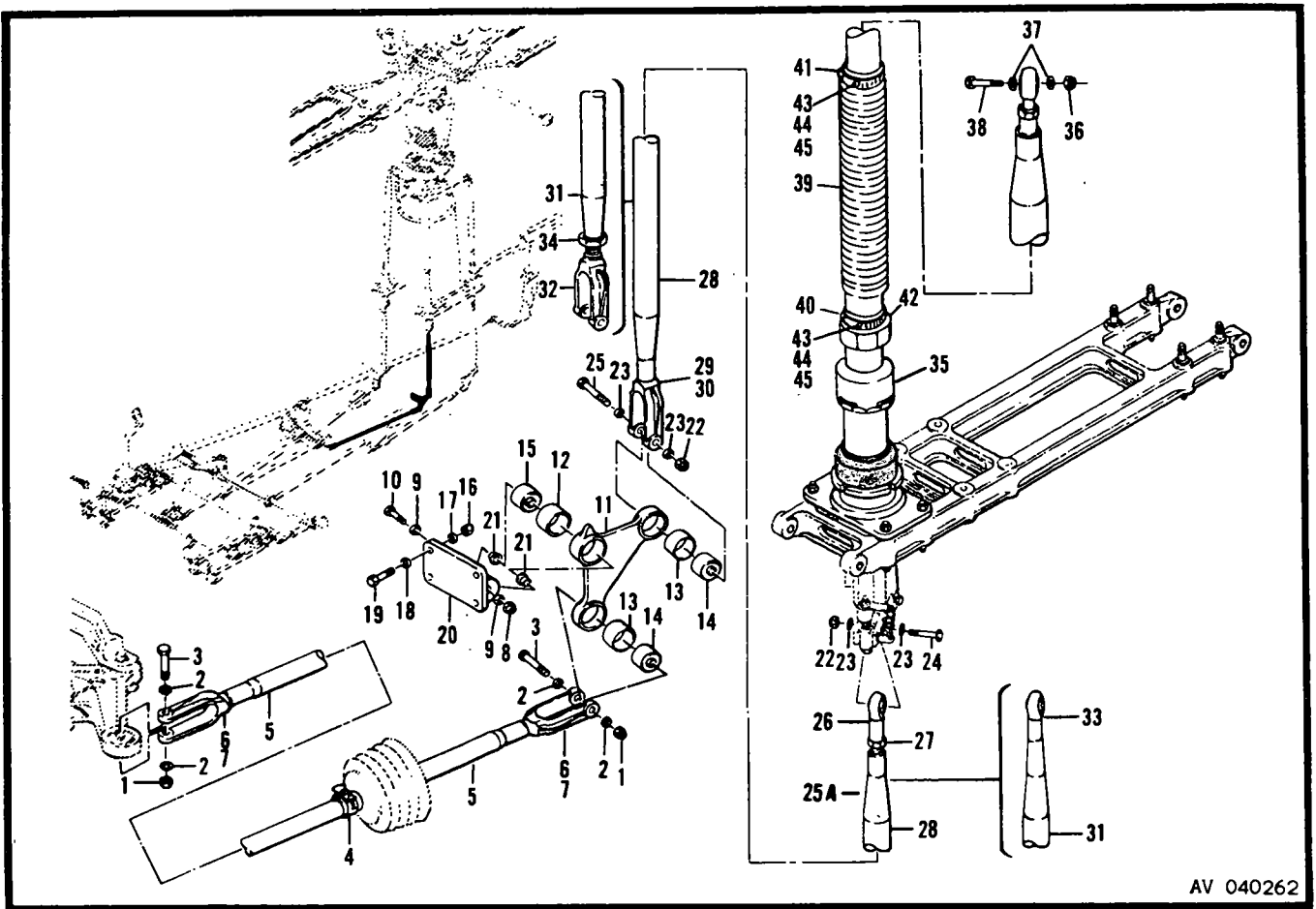


Figure 2-1. Control installation, lateral cyclic aft section.



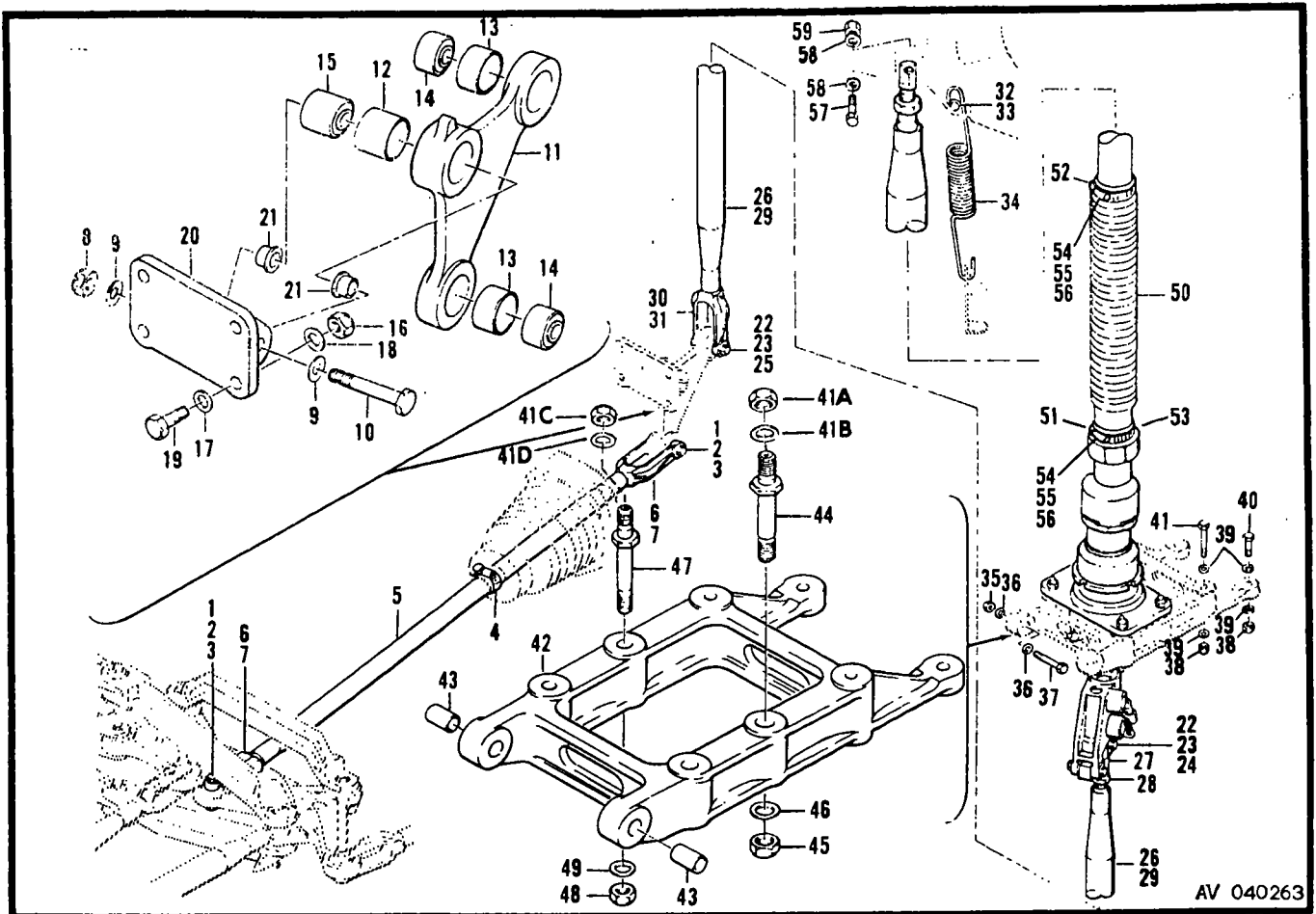


Figure 2-2. Control installation, fore and aft and lateral cyclic.

(1) Remove the bolt (fig 2-1) that secures the lower end of the control rod (item 28) to the bellcrank (item 11). Reinstall the hardware in the rod-end exactly as before removal.

(2) Remove the bolt (fig 2-2) that secures the lower end of the control rod (item 26/29) to the bellcrank (item 11). Reinstall the hardware in the rod-end exactly as before removal.

(3) Pull down both control rods until the upper cyclic control rod-ends are below the top of the fuselage.

(4) Secure both upper rod-ends at the top of the fuselage so they will not impinge on the other components during transport. Pad with cushioning material to prevent chafing.

(5) Pad and secure both lower rod-ends.

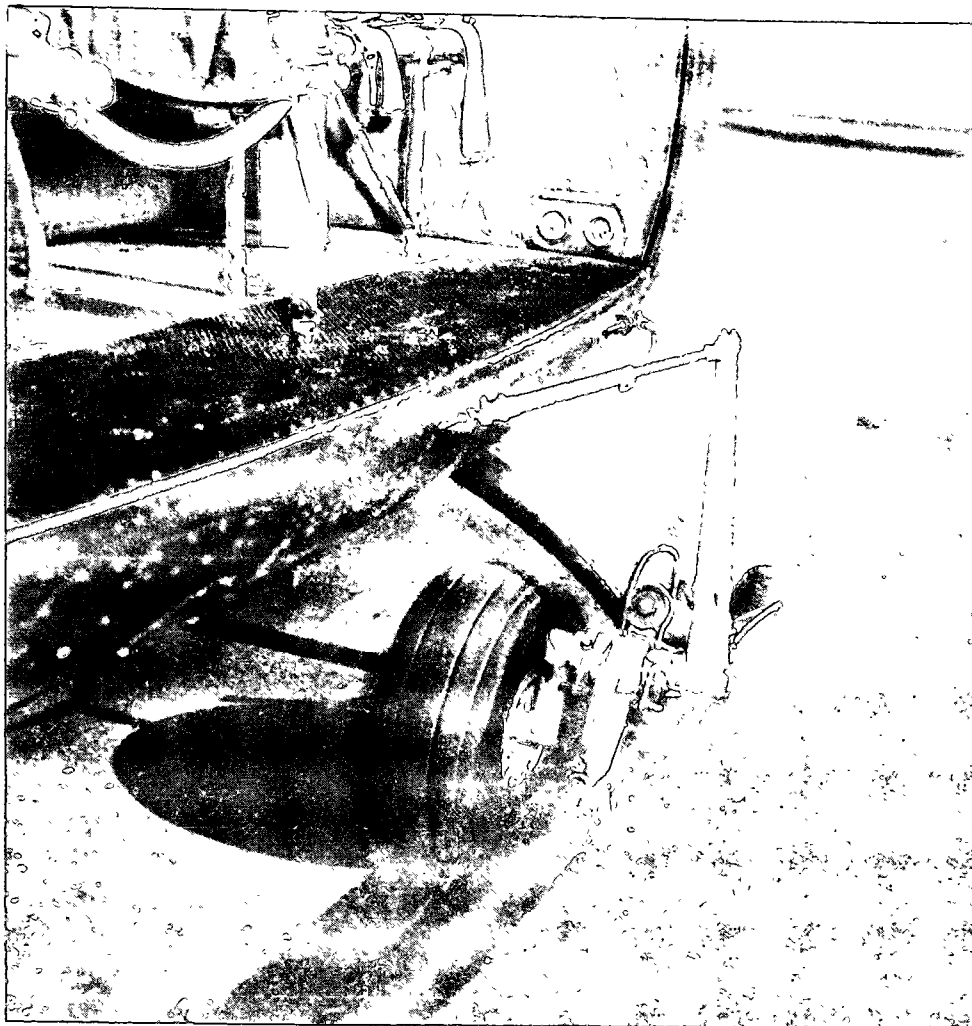
(6) Reassembly is the reverse of disassembly.

(7) Enter this disassembly-reassembly procedure on a tag. Attach the tag to the cyclic controls.

## 2-8. Ground Handling Wheels

a. All loading in this manual is accomplished with ground handling wheels installed on the helicopter.

b. If a complete set of ground handling wheels is installed on the helicopter the side-to-side distance between the outside wheels exceeds the width of the C-130 and C-141 loading ramps and cargo compartments. This condition is relieved by removing the outside wheels and installing a wheel modification kit (fig 2-3).



*Figure 2-3. Ground handling wheel with modification kit installed.*

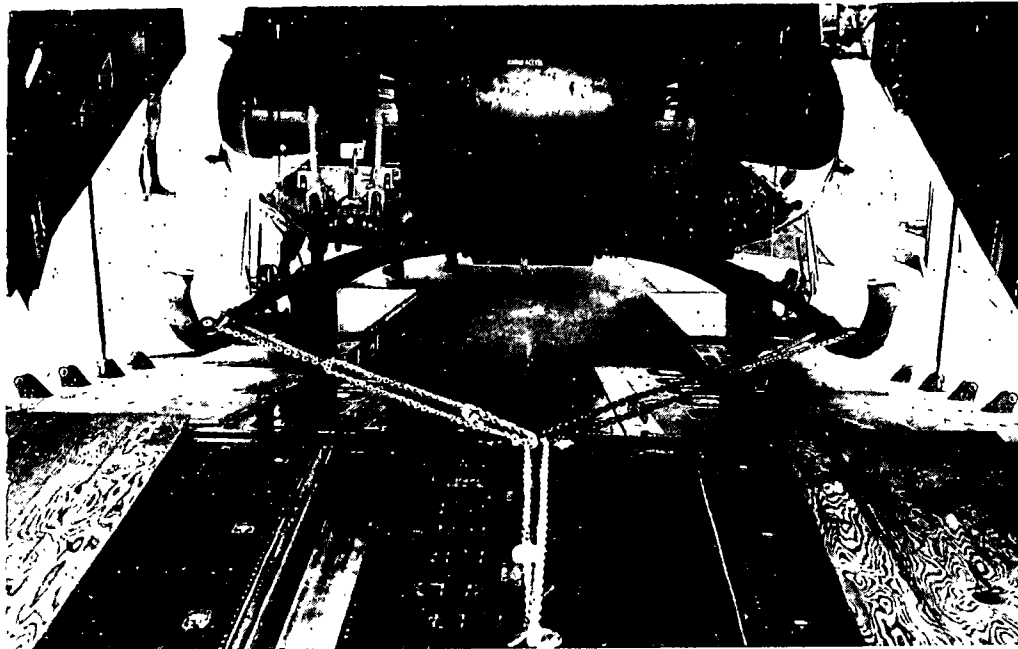
**Caution:** Insure that the ground handling wheel assemblies are facing in the proper direction when attaching to the helicopter landing skids. The fixed pin of the cradle fits in the skid rear fitting and the spring loaded pin fits in the skid forward fitting. When raising the wheels to prevent damage to the handling wheel assemblies, raise the forward end of the landing skids by pulling down on the tail skid; but do not exceed a downward force on the tail skid of more than 400 pounds. Damage to the assemblies may occur if the helicopter is lowered quickly; therefore, release pressure slowly in the hydraulic pumps.

## **2-9. Towing Bridle**

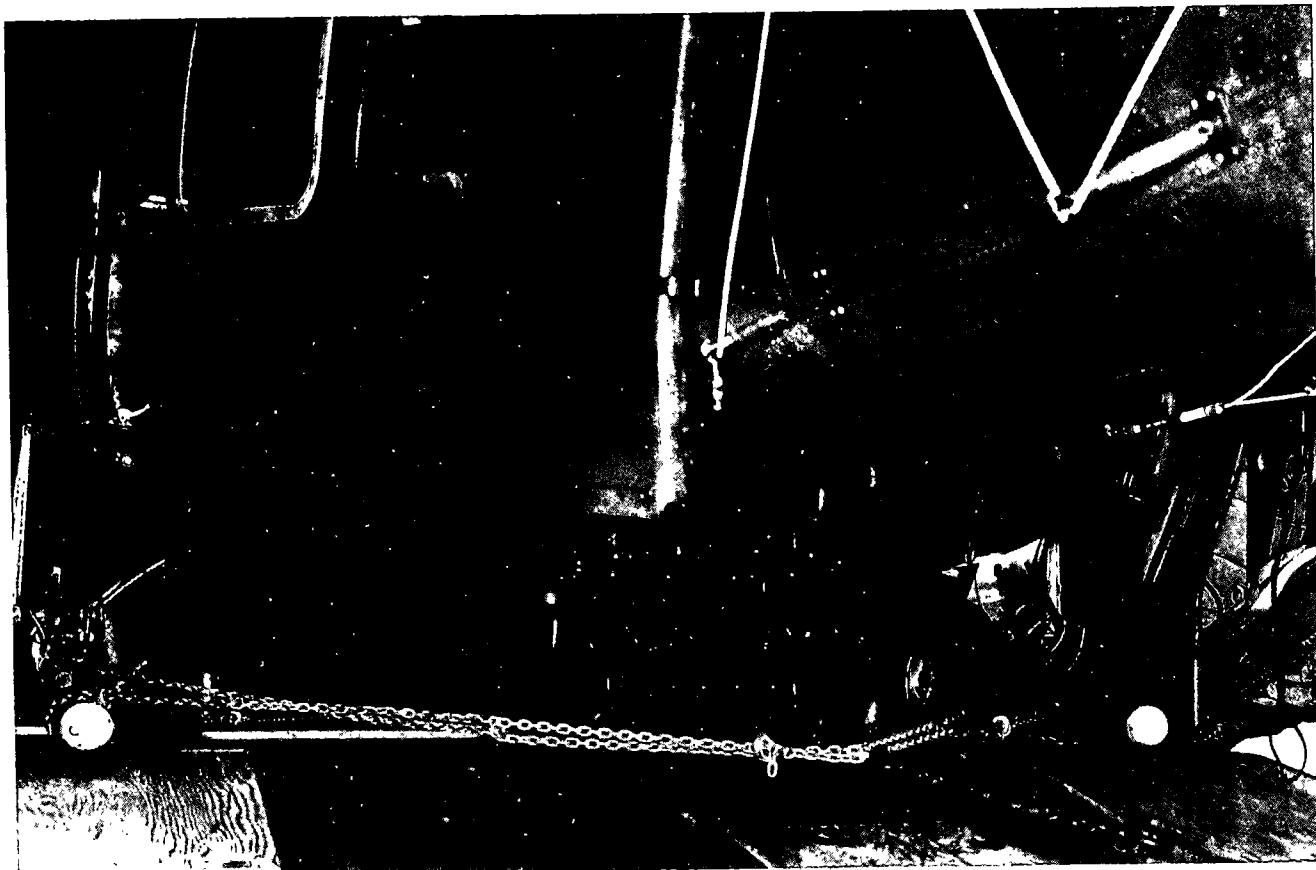
a. The towing bridle is formed of chain removed from four 10,000-pound tiedown devices (nylon straps of equivalent strength and length may be substituted for the chains).

b. Make the towing bridle by looping a chain around each end of the forward cross tube of the helicopter. The chains in addition may be passed under the skid tubes. Each chain is formed into a loop and the other chains are passed successively through the next chain.

c. The connected chains are formed into a "V" with the apex at the center front of the helicopter. The bridle is connected at its apex to the airplane winch cable (fig 2-4 and 2-5).



*Figure 2-4. The helicopter rigged with a towing bridle and ready for loading into the C-141 over the plywood ramp extension. A fifth chain loop has been attached to the bridle at the apex, then to the cable.*

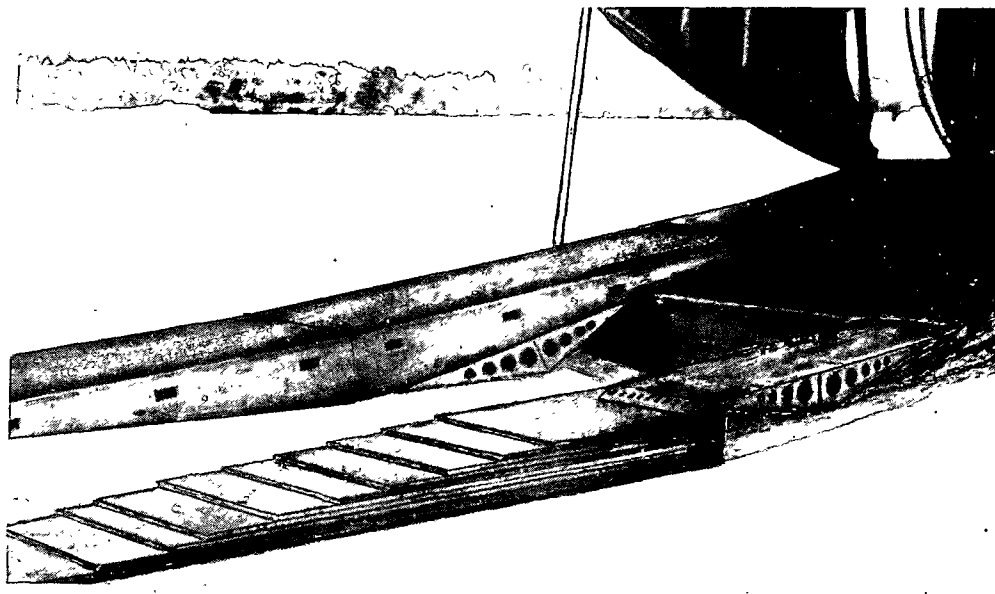


*Figure 2-5. Towing bridle with chains passed under the skid tubes.*

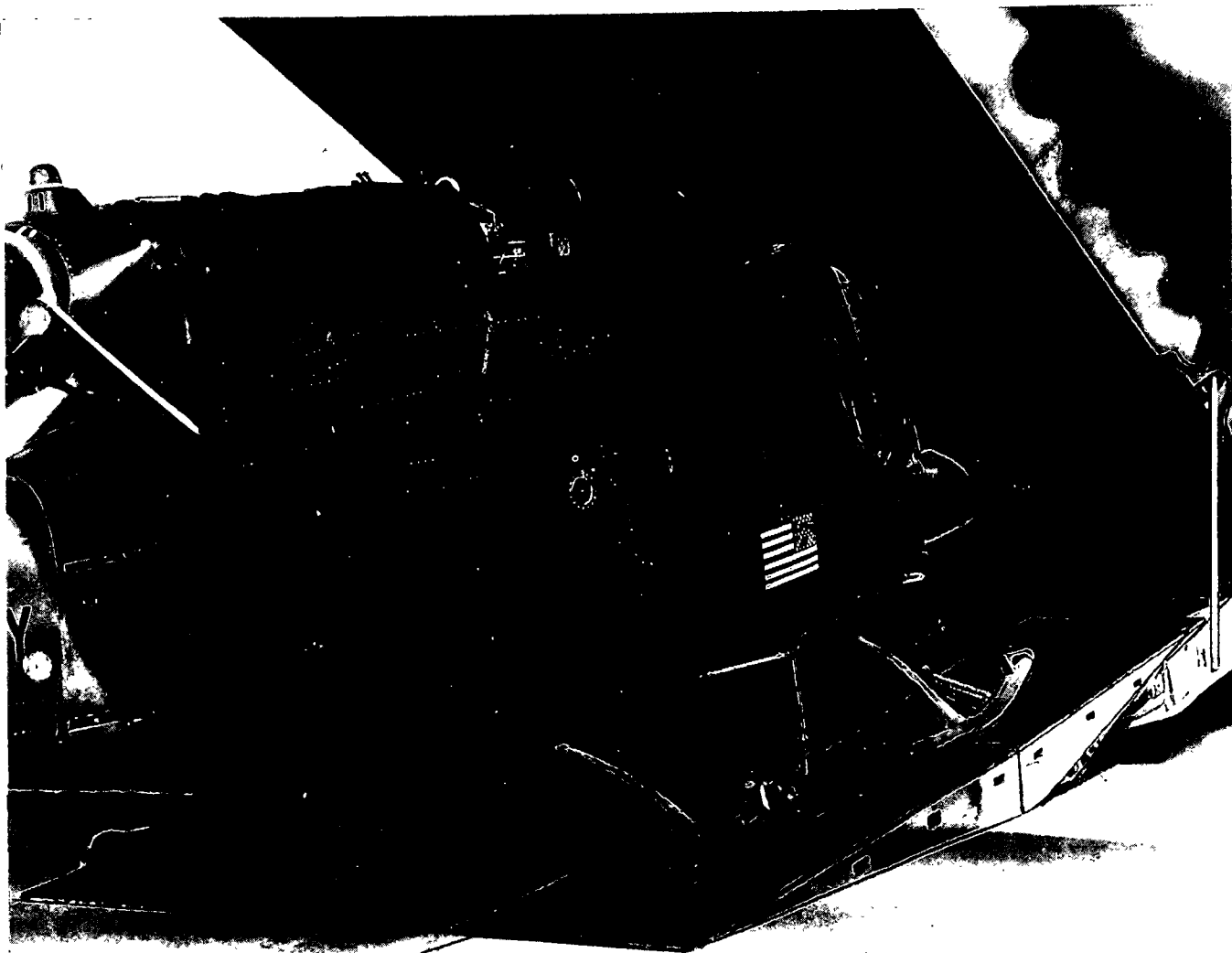
## 2-10. Ramp Extensions

a. Ramp extensions are constructed by Army loading personnel from readily obtainable material. The extensions change the ramp loading angle. This facilitates passage of the helicopter through the aircraft door and prevents the helicopter skid tubes from scraping the ground or the ramp floor. It aids also in

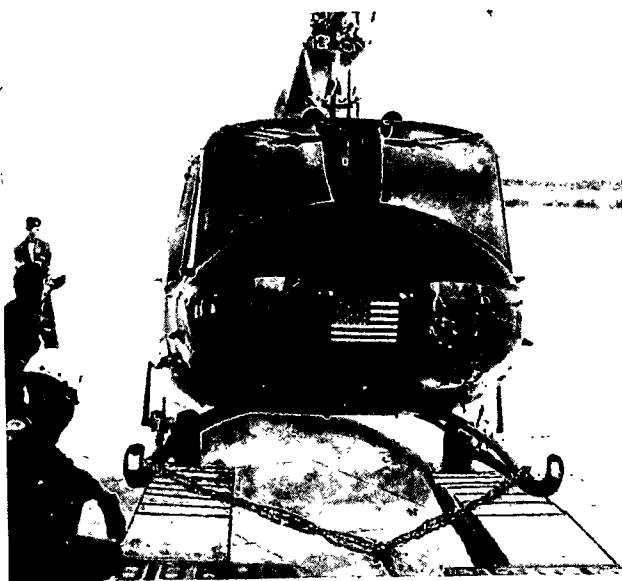
preventing contact with the upper structure of the airplane. Figure 2-6 illustrates two types of fabricated extensions which may be used in loading the C-130, C-141, or C-5 aircraft. Complete instructions on procedures and material for constructing the various extensions are given in appendix B.



*Figure 2-6. A folding ramp extension assembly (upper) and a plywood ramp extension assembly in position at the C-130 ramp. This figure is illustrative only, as identical pairs of assemblies are used in actual loading operations.*



*Figure 2-7. Loading the helicopter into the C-130 over the folding ramp extension.*



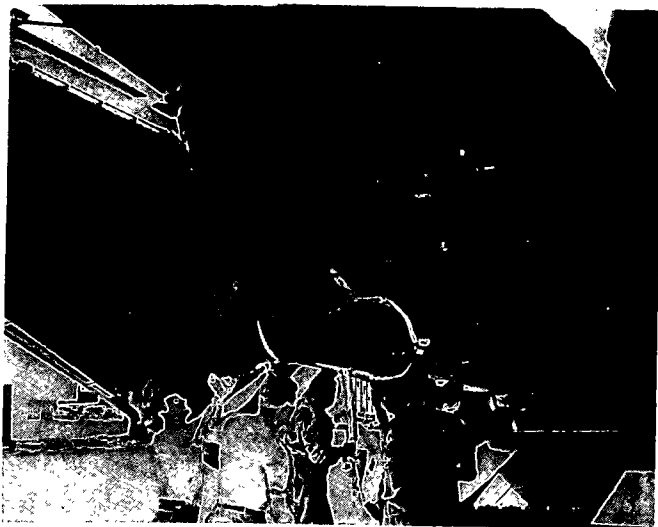
*Figure 2-8. Loading the helicopter into the C-5 over the plywood ramp extension.*

b. The lumber used for extensions may be used later as shoring under the helicopter or as an unloading ramp. Do not dispose of a ramp extension or the lumber until a decision is made on whether it is needed for shoring and/or unloading the helicopter.

#### **2-11. Control of the Tail Boom During Loading**

As the helicopter moves up the ramp into the cargo compartment of the C-130 or C-141, the tail boom must be held down until it can be released without touching a ceiling component. This entails holding the tail down until the helicopter is in the tiedown location where blocks can be placed under the front end of the skids and the tail released (fig 2-10). To facilitate this control of the boom during loading, pass straps over and around the aft end of the boom, forward of the pylon, so that two men can each grasp a strap to pull the boom down. Other men use the tail skid and retractable lift arm to lift the boom and steer the helicopter into the airplane (fig 2-9).

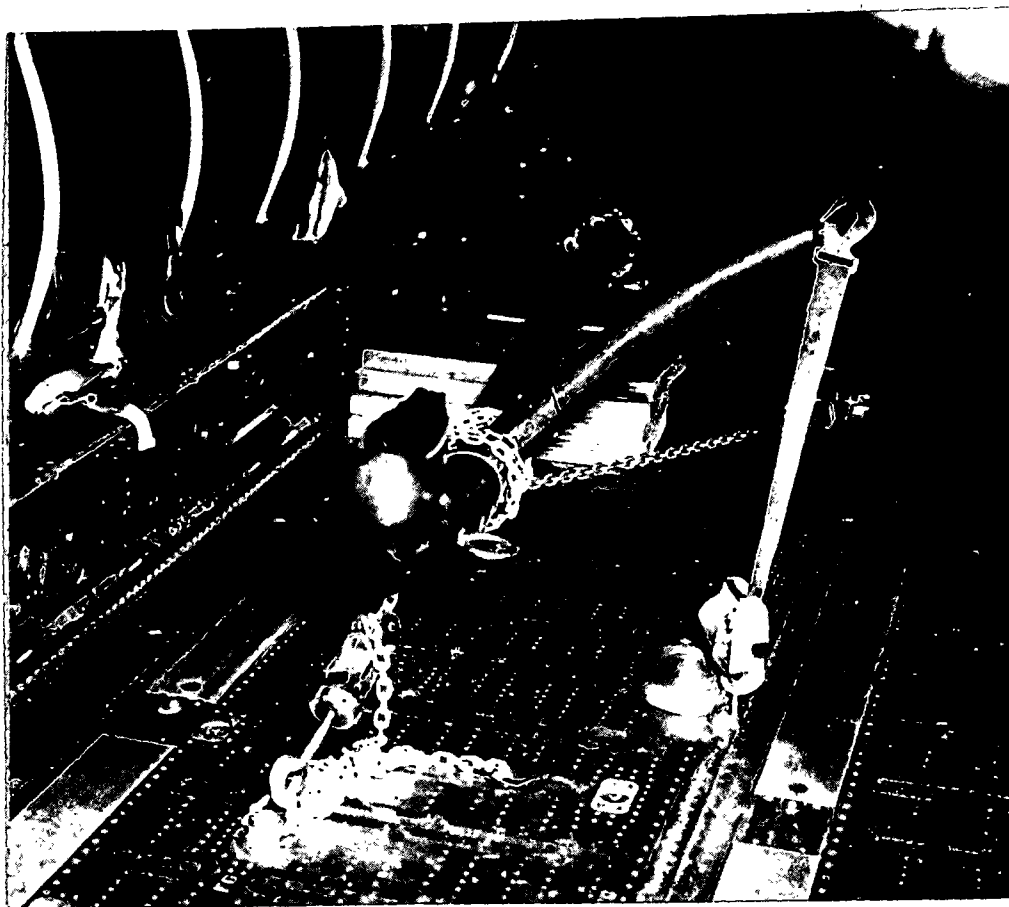
**Caution:** Do not use the omni antennas or the tail rotor shaft as a handhold or in any other way as a loading/ tiedown aid, for they are easily damaged if an unusual stress is applied to them. The loading team must hold the helicopter's tail down to prevent the pylon from touching the airplane's upper structure. Teamwork and very careful handling are essential throughout the loading operation to prevent damage to the helicopter or the airplane.



*Figure 2-9. Control of the tail during loading of the helicopter into C-141.*

## **2-12. Blocking Under the Skids for Tie Down**

In loading into the C-130 or C-141 airplanes, it is necessary to hold the helicopter's tail down throughout loading and block up the front end of the skid tubes in the tiedown location to prevent the pylon from striking the aircraft upper structure. The blocking is left in place for tie down and transport of the helicopter. Blocking is not required if the tail boom has been removed from the helicopter. Four 2- by 8- by 24-inch stacked boards are used for blocking under each skid (fig 2-10).



*Figure 2-10. Blocking under the skid tubes to hold the tail down for tie down of the helicopter.*

## 2-13. Tiedown Diagrams

a. Plans on how to tie down the helicopter in each airplane are illustrated in tiedown diagrams. Each diagram shows a plan view of the helicopter landing gear and part of the tail boom superimposed on the airplane tiedown-fitting pattern. Tiedown devices appear as heavy solid lines identified by the same number used in tiedown instructions which specify where to attach tiedown devices on the helicopter.

b. The lines depicting tiedown devices reveal approximate angles and distances between points of attachment on the helicopter and airplane tiedown fittings. Satisfactory angles of tie will result when tiedown devices are attached to floor fittings the same distance from points of attachment shown in the diagram. Variations in angles of tie will occur when the location of the helicopter is changed, but the effect on restraint forces will be slight.

c. Regardless of how many helicopters are loaded or where they are located in the airplane, the tiedown plan shown is the appropriate diagram applicable for each helicopter. To assure proper restraint, a tiedown device of at least the strength specified must be attached on the helicopter at the point indicated in the tiedown instructions.

d. The airplane tiedown fittings in the diagram have not been identified because the location of the helicopter in the airplane is not known until time of loading. When weight and balance data are available, the loadmaster will designate where the helicopter(s) will be located in the airplane.

*Caution: Do not put too much tension on the tiedown straps attached to the tail boom. Due to the long lever arm, between the tiedown straps and the aft cross tubes, a small stress on the tail boom could be magnified enough to damage the helicopter.*

## CHAPTER 3

### TRANSPORT IN C-130 AIRPLANE

#### 3-1. General

a. Only one helicopter can be transported in the C-130, with or without the 463L system installed.

The helicopter is always loaded facing the forward end of the airplane (fig 3-1).

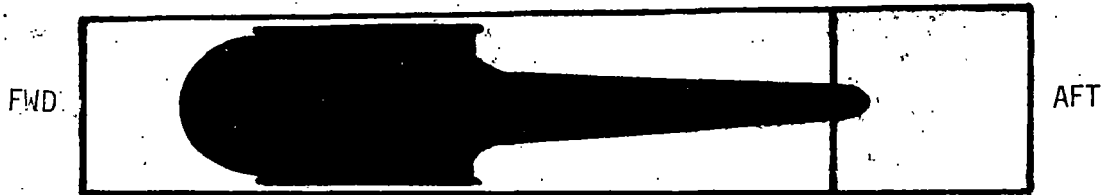


Figure 3-1. Direction the helicopter faces in the C-130.

b. The helicopter is pulled into the airplane by means of the airplane winch. The main task of the Army personnel is to maneuver the helicopter as directed by the loadmaster.

c. It is not possible to load the helicopter when a complete set of UH-1 ground handling wheels are installed. The outside wheels must be removed and a wheel modification kit attached (fig 2-3).

d. The chief of the loading team moves about during preparation, loading, tie down, and unloading as most advantageous to direct the operations.

#### 3-2. Preparation

##### a. Material.

(1) Materials needed to construct a ramp extension (app B).

(2) Materials needed for packing and cushioning the removed components (para 2-7).

(3) One set of ground handling wheels with modification kit.

(4) Four 10,000-pound tiedown device chains or straps for the towing bridle.

(5) Two 5,000-pound nylon straps for tail boom control.

b. *Personnel and Time.* Seven men prepare the helicopter and airplane in 1½ hours.

##### c. Procedure.

(1) Review paragraph 2-7.

(2) Remove the following components: FM radio and homing antennas, UHF radio set antenna, main rotor blades, stabilizer bar assembly, main rotor hub, mast and swashplate assembly,

one tail rotor blade (secure remaining blade to tail pylon), synchronized elevators, and rearview mirror.

(3) Process, package, and stow the removed components as prescribed in paragraph 2-7.

(4) Construct a ramp extension (app B).

(5) Install the ground handling wheels and wheel modification kit.

(6) Lay shoring as required.

(7) Form and attach the towing bridle to the helicopter.

(8) Loop the nylon straps around the tail boom.

#### 3-3. Loading

##### a. Material.

(1) Eight pieces of 2- by 8- by 24-inch lumber, for blocking up the front of the helicopter skid tubes in the tiedown location. This holds the pylon down and prevents it from touching the airplane ceiling.

(2) Shoring as required.

b. *Personnel and Time.* Seven men can load the helicopter in ½ hour.

##### c. Procedure.

(1) Position the helicopter at the foot of the ramp extension and facing the airplane (fig 2-8).

(2) Connect the airplane winch cable to the towing bridle.

(3) Station one man on each side of the ramp in front of the helicopter to check clearances and give signals for control of the helicopter as it is moved into tiedown location in the cargo compartment.



(4) Station four men at the tail to lift and steer the helicopter and prevent contact with the airplane structure. To facilitate holding the tail down, two of the men pull on the ends of the tail boom control straps.

**Caution:** Do not allow the loading personnel to come into contact in any way with the radio omni antennas. These antennas have the deceptive appearance of typical handhold fixtures.

(5) Commence winching the helicopter up the ramp. When the slack is taken up in the cable and the helicopter begins to move, lift up the tail until the helicopter landing gear is completely on the ramp.

(6) Hold the tail down to clear the airplane upper structure, then continue the winching.

(7) Stop winching when the tail of the helicopter clears the airplane loading door.

(8) Detach the winch, cable, and towing bridle.

(9) Push the helicopter into tiedown location. Be careful not to allow the pylon to touch the ceiling or pendulum release mechanism.

(10) With the tail still held down, place four stacked 2- by 8- by 24-inch pieces of lumber under the front of each skid tube to prevent the pylon from touching the upper structure of the cargo compartment.

(11) Put shoring under the skid tubes.

(12) Remove the ground handling wheels and the boom control straps.

(13) Load the main rotor blades into their tiedown locations.

### 3-4. Tie Down

**a. Materiel.** Seven 5,000-pound and six 10,000-pound tiedown devices for the helicopter. Additional tiedown devices for the rotor blades and any other components will be selected by the loadmaster.

**b. Personnel and Time.** Seven men tie down the helicopter and components in ½ hour.

**c. Procedure.** Tie down the helicopter and rotor blades (or blade boxes) as shown in figure 2-10, 4-2, 4-3, and 4-4.

### 3-5. Unloading

Unloading the helicopter from the aircraft is essentially the reverse of loading. Thus, review the entire manual before planning the unloading operation. The winch cable is used to restrain the helicopter as it is pushed from the airplane.

#### **a. Materiel.**

(1) Materials to construct a ramp extension (app B).

(2) Shoring as required.

(3) Tiedown device chains as required for the towing bridle.

(4) One set of ground handling wheels with modification kit.

(5) Nylon straps for boom control.

**b. Personnel and Time.** Seven men remove the tiedown devices and blocking, install the ground handling wheels and towing bridle, lay shoring, and unload the helicopter from the airplane in 20 minutes.

#### **c. Procedure.**

(1) Remove the tiedown devices, construct the ramp extension, and attach the control straps.

(2) Station the guides at each side of the helicopter and the control personnel at the tail.

(3) With the tail held down, push the helicopter to the crest of the airplane ramp.

(4) Form the towing bridle and attach to the helicopter and winch cable the same as for loading. Use the winch cable for braking during movement down the ramp.

(5) With the tail still held down, push the helicopter over the ramp crest under control of the winch cable, then down the ramp and extension onto the ground clear of the airplane.

## CHAPTER 4

### TRANSPORT IN C-141 AIRPLANE

#### 4-1. General

a. Two UH-1 helicopters of any model can be loaded into the C-141 without removing the tail booms. If the tail booms are removed, three UH-1A/B/C helicopters may be carried. Even if the

tail booms are removed from the UH-1D/H helicopters only two can be loaded. Figure 4-1 shows the arrangement of the helicopters in tiedown location and the direction they face.

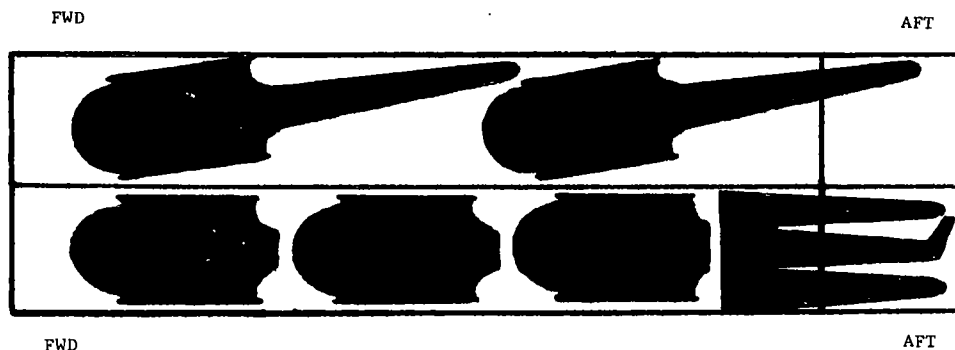


Figure 4-1. Maximum helicopter loads for the C-141.

b. Figure 4-2 shows the tiedown pattern for helicopters which have not had the tail booms removed. The same fuselage restraint pattern is used for the tailless fuselages, and also for the helicopter which is tied down in part to ramp fittings.

c. The helicopter is pulled into the airplane by means of the airplane winch. The winch is rigged and operated by the airplane crew. The Army personnel manhandle the helicopter into tiedown position and attach the tiedown devices as directed by the loadmaster.

d. It is impossible to load the helicopter with a complete set of UH-1 ground handling wheels installed. The outside wheels must be removed and a wheel modification kit attached (fig 2-3). The wheels are placed on the skid tubes as far forward as possible for best loading clearance and balance.

e. The chief of the loading team moves about during preparation loading, tie down, and unloading as most advantageous to direct the operations.

#### 4-2. Preparation

##### a. Materiel.

(1) Materials needed for constructing a ramp extension (app B).

(2) Materials needed for packing and cushioning the removed components (para 2-7).

(3) One set of ground handling wheels with modification kit.

(4) Four 10,000-pound tiedown device chains or straps for the towing bridle.

(5) Two 5,000-pound nylon straps for tail boom control.

##### b. Personnel and Time.

(1) *Tail booms not removed.* Placing of shoring/lumber for airplane and ramp, disassembly of helicopter, packaging of components, and tie down inside of helicopter: seven men, 1½ hours.

(2) *Tail booms removed.* Placing of shoring/lumber for airplane and ramp, disassembly of helicopter, packaging of components, and tie down inside of helicopter: seven men, 2½ hours.

##### c. Procedure.

(1) Review paragraph 2-7.

(2) Remove the following components: FM radio and homing antennas, UHF radio set antenna, main rotor blades, stabilizer bar assembly, one tail rotor blade (secure remaining blade to tail pylon), synchronized elevators, and rearview mirror. Remove tail booms, if applicable.

(3) Process, package, and stow the removed components as prescribed in paragraph 2-7. Set the tail booms aside as they are loaded last. Place them on cushioning material so they will not be damaged.

(4) Construct ramp extensions and extension toes as required (app B).

(5) Install the ground handling wheels and wheel modification kit.

(6) Form and attach the towing bridle to the helicopter.

(7) Loop the nylon straps around the tail boom.

#### 4-3. Loading

##### a. General.

(1) The term "helicopter" refers to the helicopter with or without tail boom.

(2) Winch and shove the boomless helicopters into the cargo compartment nose first and as far forward as possible. As the pylon is removed with the tail boom, there is no height problem in loading and the front of the skid tubes do not have to be blocked up in tiedown location.

(3) If the main rotor blades are loaded before the next helicopter, a clear path on the airplane floor must be left for the winch cable.

##### b. Materiel.

(1) Eight pieces of 2- by 8- by 24-inch lumber for blocking up the front of the helicopter skid tubes in the tiedown location. This holds the pylon down and prevents it from touching the airplane ceiling.

(2) Shoring as required.

(3) Cushioning material on which to stow the removed tail booms; for example, salvaged mattresses.

c. *Personnel and Time.* Seven men load one helicopter (and its tail boom) in ½ hour.

##### d. Procedure.

(1) Position the helicopter at the foot of the ramp extension and facing the airplane.

(2) Connect the airplane winch cable to the towing bridle.

(3) Station one man on each side of the ramp in front of the helicopter to check clearances and give signals for control of the helicopter as it is moved into tiedown location in the cargo compartment.

(4) Station four men at the tail to lift and steer the helicopter and prevent contact with the airplane structure. To facilitate holding the tail down, two of the men pull on the ends of the tail boom control straps.

**Caution:** Do not allow the loading personnel to come into contact in any way with the radio omni antennas. These antennas have the deceptive appearance of typical handhold fixtures.

(5) Commence winching the helicopter up the ramp. When the slack is taken up in the cable and the helicopter begins to move, lift up the tail until the helicopter landing gear is completely on the ramp.

(6) Hold the tail down to clear the airplane upper structure then continue winching.

(7) Stop winching when the tail of the helicopter clears the airplane pressure door.

(8) Detach the winch cable and towing bridle.

(9) Push the helicopter into tiedown location. Be careful not to allow the pylon to touch the overhead structure of the airplane.

(10) With the tail still held down, place four stacked 2- by 8- by 24-inch pieces of lumber under the front of each skid tube to keep the pylon off the ceiling.

(11) Put shoring under the skid tubes.

(12) Remove the ground handling wheels and the boom control straps.

(13) Load the main rotor blades into their tiedown locations.

(14) After the boomless helicopters and their rotor blades are loaded, load the tail booms on cushioning material, positioning as far forward as possible as shown in figure 4-1.

#### 4-4. Tie Down

a. *Materiel.* Seven 5,000-pound and six 10,000-pound tiedown devices for each helicopter. Additional tiedown devices for the rotor blades and any other components will be selected by the loadmaster.

b. *Personnel and Time.* Seven men tie down one helicopter and its components in ½ hour.

##### c. Procedure.

(1) Tie down the helicopter as shown in figures 2-10, 4-2, 4-3, and 4-4.

(2) Tie down the rotor blades (or blade boxes) as directed by the loadmaster.

(3) Tie down the tail booms.

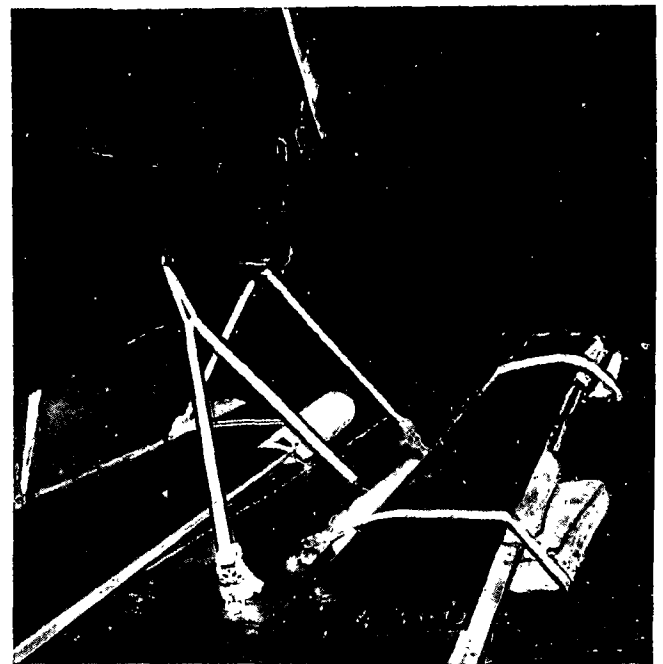
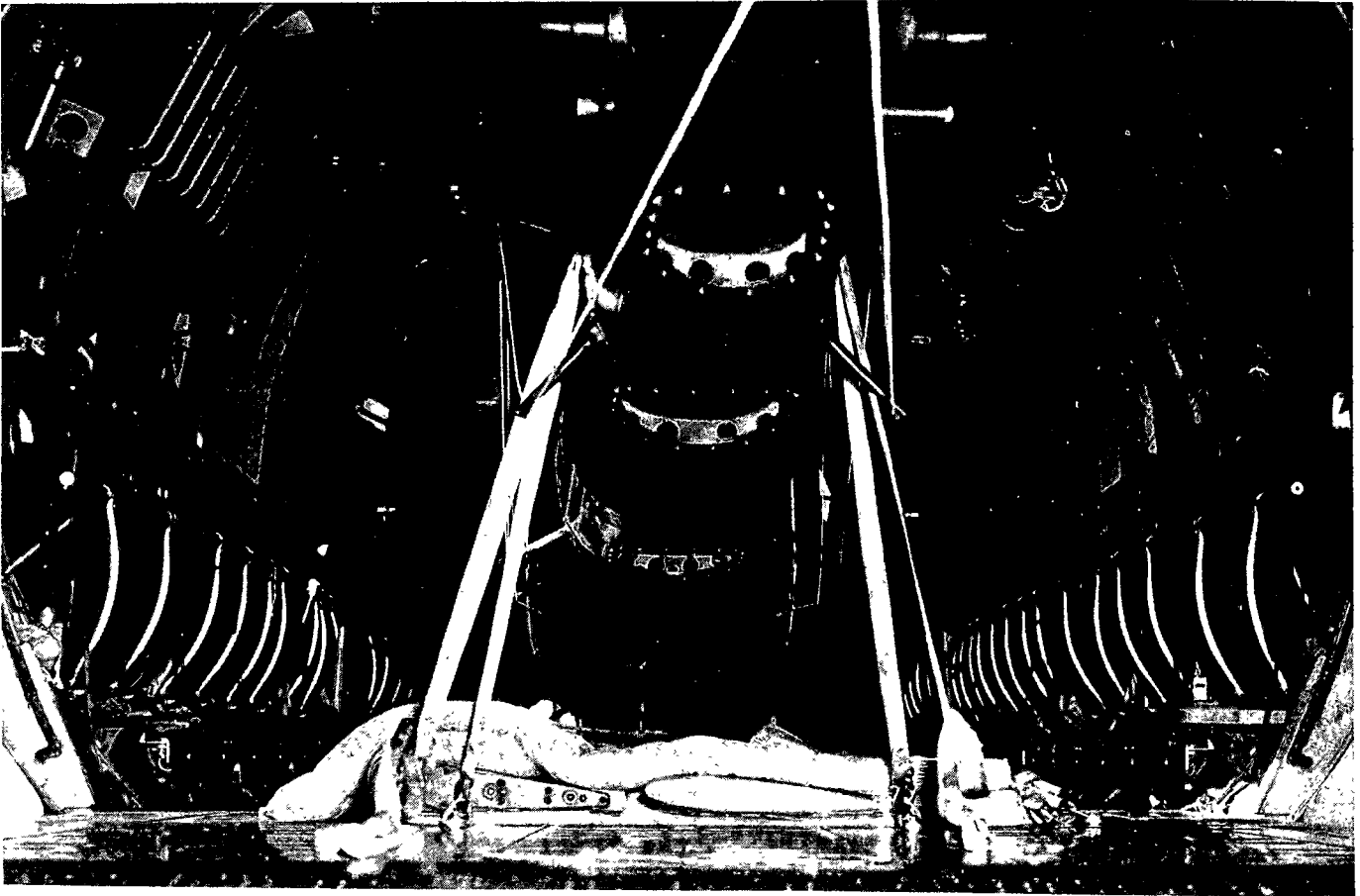
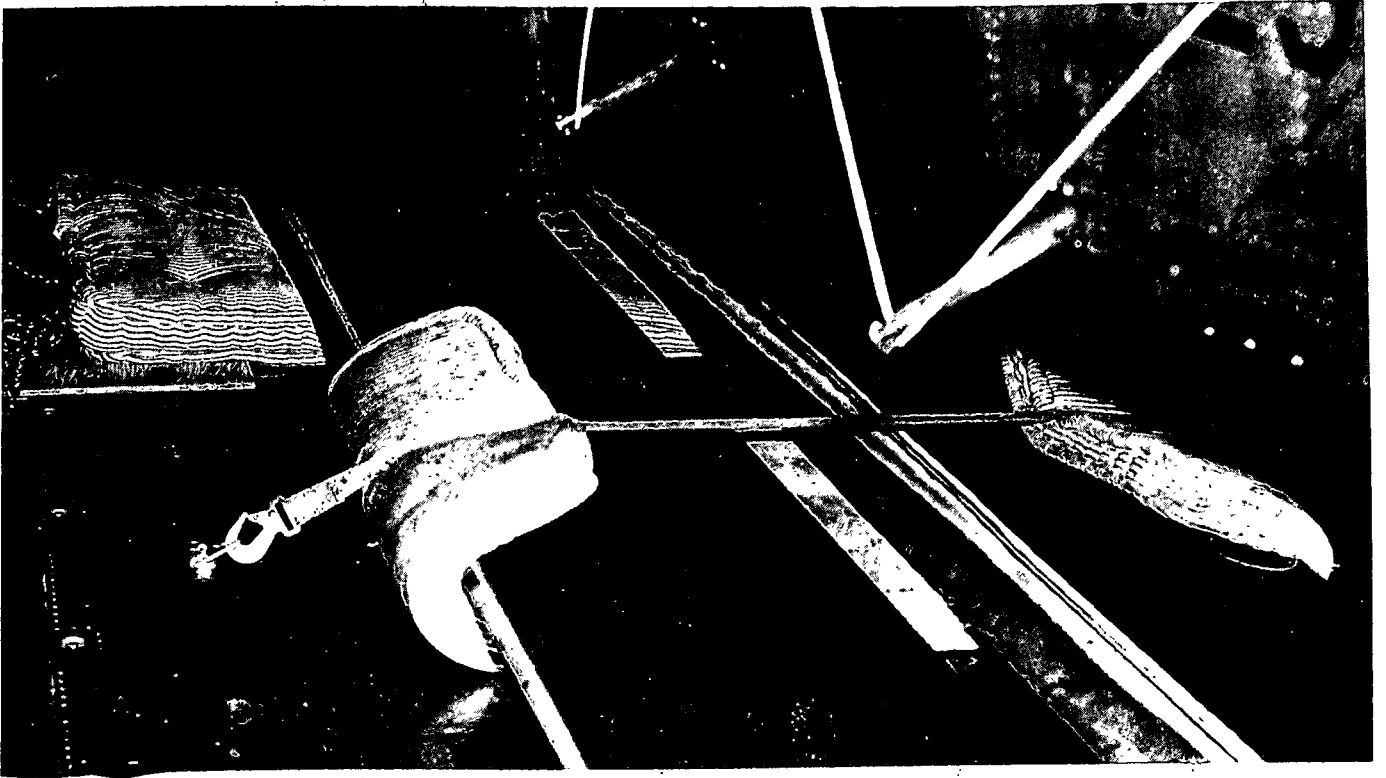


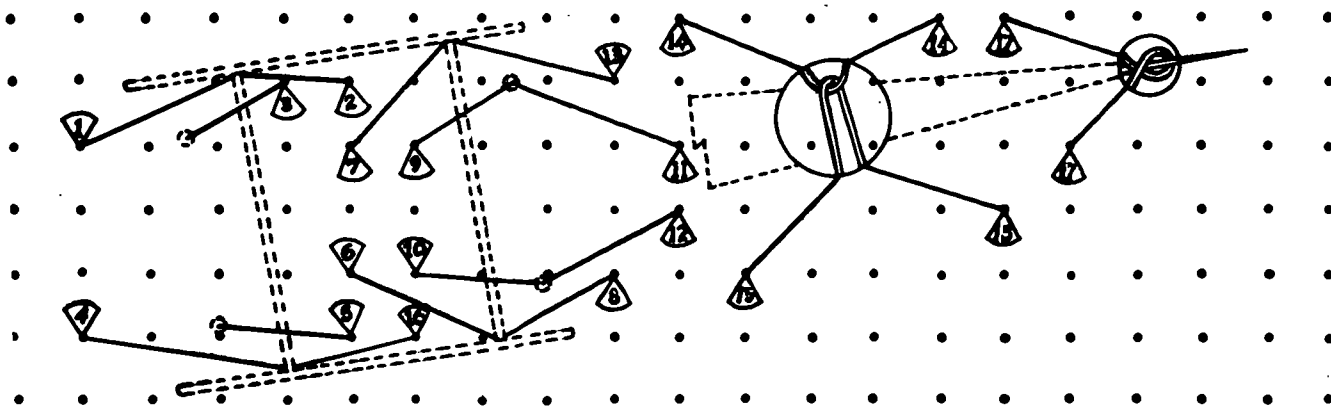
Figure 4-2. Tie down of the aft end of the helicopter and the stacked, cushioned main rotor blades.



*Figure 4-3. Side-by-side method of cushioning and tying down the main rotor blades.*



*Figure 4-3—Continued.*



#### TIEDOWN INSTRUCTIONS

| <u>Point of attachment<br/>on helicopter</u> | <u>Tiedown device No.</u>   | <u>Tiedown device<br/>capacity in 1,000 lb</u> |
|----------------------------------------------|-----------------------------|------------------------------------------------|
| Mooring ring                                 | 3, 5, 9, 10, 11, 12         | 5                                              |
| Cross tube (at skid)                         | 1, 2, 4, 16, 6, 8, 7,<br>13 | 10                                             |
| Tail boom (through<br>elevator hole)         | 14, 15                      | 5                                              |
| Tail skid                                    | 17                          | 5                                              |

Figure 4-4. Tiedown diagram and instructions for the helicopter in the C-130 or C-141 airplanes.

#### 4-5. Unloading

Unloading the helicopter from the aircraft is essentially the reverse of loading. Thus, review the entire manual before planning the unloading operation. The winch cable is used to restrain the helicopter as it is pushed from the airplane down the ramp.

##### a. Materiel.

- (1) Materials to construct a ramp extension (app B).
- (2) Shoring as required.
- (3) Tiedown device-chains as required for the towing bridle.
- (4) One set of ground handling wheels with modification kit.
- (5) Nylon straps for boom control.

b. *Personnel and Time.* Seven men remove the tiedown devices and blocking, install the ground handling wheels, boom control straps, end towing

bridle, lay shoring, and unload the helicopter from the airplane in 20 minutes.

##### c. Procedure.

- (1) Remove the tiedown devices, construct the ramp extension and attach the control straps.
- (2) Station the guides at each side of the helicopter and the control personnel at the tail.
- (3) Unload the tail booms and place on cushioning material.
- (4) With the tail held down push the helicopter to the crest of the airplane ramp.
- (5) Form the towing bridle and attach to the helicopter and winch cable the same as for loading. Use the winch cable for breaking during movement down the ramp.
- (6) With the tail still held down push the helicopter over the ramp crest under control of the winch cable, then down the ramp and extension onto the ground clear of the airplane.

## CHAPTER 5

### TRANSPORT IN C-5 AIRPLANE

#### 5-1. General

a. As the instructions for loading the UH-1 helicopter into other airplanes can be helpful when loading it into the C-5, it is recommended that all the loads in this manual be reviewed before planning the C-5 load.

b. Seven UH-1D/H helicopters can be transported in the C-5 by removing the synchronized

elevators, the horizontal stabilizers, the forward cargo doors, and the FM radio antenna. Inadequate overhead clearance at the aft ramp of the C-5 restricts this configuration of the UH-1D/H to loading through the forward door of the C-5. Load the helicopters in numbered sequence, facing as shown in figure 5-1.

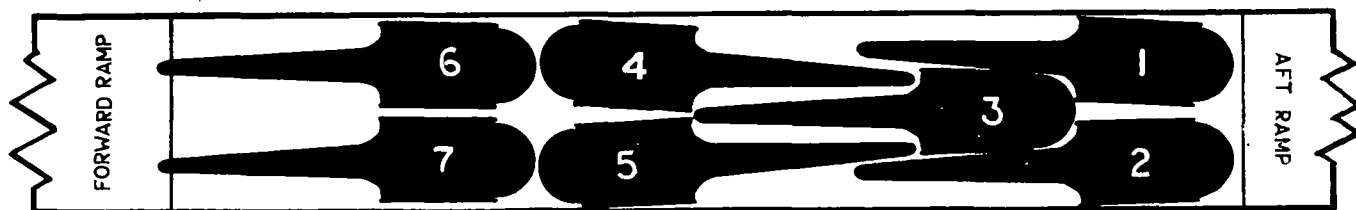


Figure 5-1. Direction helicopters face for seven UH-1's in the C-5.

c. The extent of disassembly for each helicopter depends on its tiedown location. Individual helicopter components are removed only as necessary for clearance.

d. The toe of the C-5 ramp impedes movement of the helicopter onto the ramp. Relieve this by laying a ramp extension.

e. The C-5 winch is used to pull the helicopter up the ramp during loading and to brake the helicopter as it moves down the ramp during unloading.

f. Load and unload the helicopter with the C-5 in forward kneel.

#### 5-2. Preparation.

##### a. Materiel.

(1) The material for construction of a ramp extension depends on the one used. This information is given in appendix B. If none of these ramp extensions are feasible, then the ramp-toe extension shown in figure 5-2 may be used. This ramp extension requires five pieces of 2-inch by 12-inch by 12-foot lumber. Lay one piece crosswise at the toe of the C-5 ramp and lay four pieces over the first and up the ramp as shown in figure 5-2.

(2) A minimum of two sets of UH-1 ground handling wheels.

(3) Four MB-1 tiedown device chains for the towing bridle.

(4) Sufficient ½-inch felt sheeting, salvaged mattresses, or other cushioning material to pad

the forward cargo doors, the synchronized elevators, and the FM radio antennas for tie down.

(5) Twenty-eight pieces of 2- by 12- by 100-inch clear pine lumber for construction of 14 tiedown beams.

(6) Eight pounds of 30-penny common nails for the tiedown beams.

b. *Personnel and Time.* Eight men prepare the helicopter and airplane in 30 minutes.

##### c. Procedure.

(1) Construct 14 tiedown beams (two per helicopter) by nailing two pieces of the 100-inch lumber together lengthwise and along their edges, as shown in figure 5-3.

(2) Attach the ground handling wheels to the helicopter skids.

(3) Form a towing bridle with the tiedown chains and attach it to the helicopter cross tube as shown in figures 2-4, 2-5, and 2-8. The towing bridle is attached to the front cross tube of front-first loaded helicopters and to the rear cross tube of those loaded tail-first.

(4) Construct a ramp extension (app B).

(5) Remove forward cargo doors, and stow, cushion, and tie down as shown in figure 5-4 or 5-5 (all helicopters).

(6) Push the aft cargo doors to the rear and lock in place (all helicopters).

(7) Remove the FM radio whip antennas and

the stabilizer bars. Cushion, stow, and tie down in the helicopters (all helicopters).

(8) Remove the RIGHT synchronized elevators. Cushion, stow, and tie down in the helicopters as shown in figure 5-4 or 5-5 (helicopters No. 1 and No. 6).

(9) Remove the LEFT synchronized

elevators. Cushion, stow, and tie down in the helicopters as shown in figures 5-4 or 5-5 (helicopters No. 2 and No. 7).

(10) Remove both synchronized elevators. Cushion, stow, and tie down in the helicopters as shown in figure 5-6 (helicopters No. 3, No. 4, and No. 5).



*Figure 5-2. Loading the helicopter over the C-5 forward ramp. Note the ramp extension and positioning of the loading team, particularly the man standing by the rotor mast to observe overhead clearance.*

### 5-3. Loading

*a. Materiel.* Fourteen pieces of 3/4-inch by 1-foot by 8-foot plywood parking shoring placed under the skids for tie down of the helicopters.

*b. Personnel and Time.* Eight men load one helicopter into the C-5 in 10 minutes.

*c. Procedure.*

(1) Position the helicopter, facing in the appropriate direction, in front of the C-5 ramp in line with the ramp extension. Attach the winch cable hook to the towing bridle.

(2) Station the eight-man loading team as shown in figure 5-2: four men at the empennage; two men at the cargo door openings; one man on top of the helicopter cabin to observe overhead clearance to manipulate the rotor components to prevent contact with the airplane and to pass information to the team leader; the leader moves

about as best to observe the loading and give instructions.

(3) Winch the helicopter up the ramp into the airplane.

(4) The men at the empennage move the tail up or down as necessary to prevent contact with the airplane that could result in damage. They keep the tail raised until the helicopter is past the ramp hinge, then loading is halted.

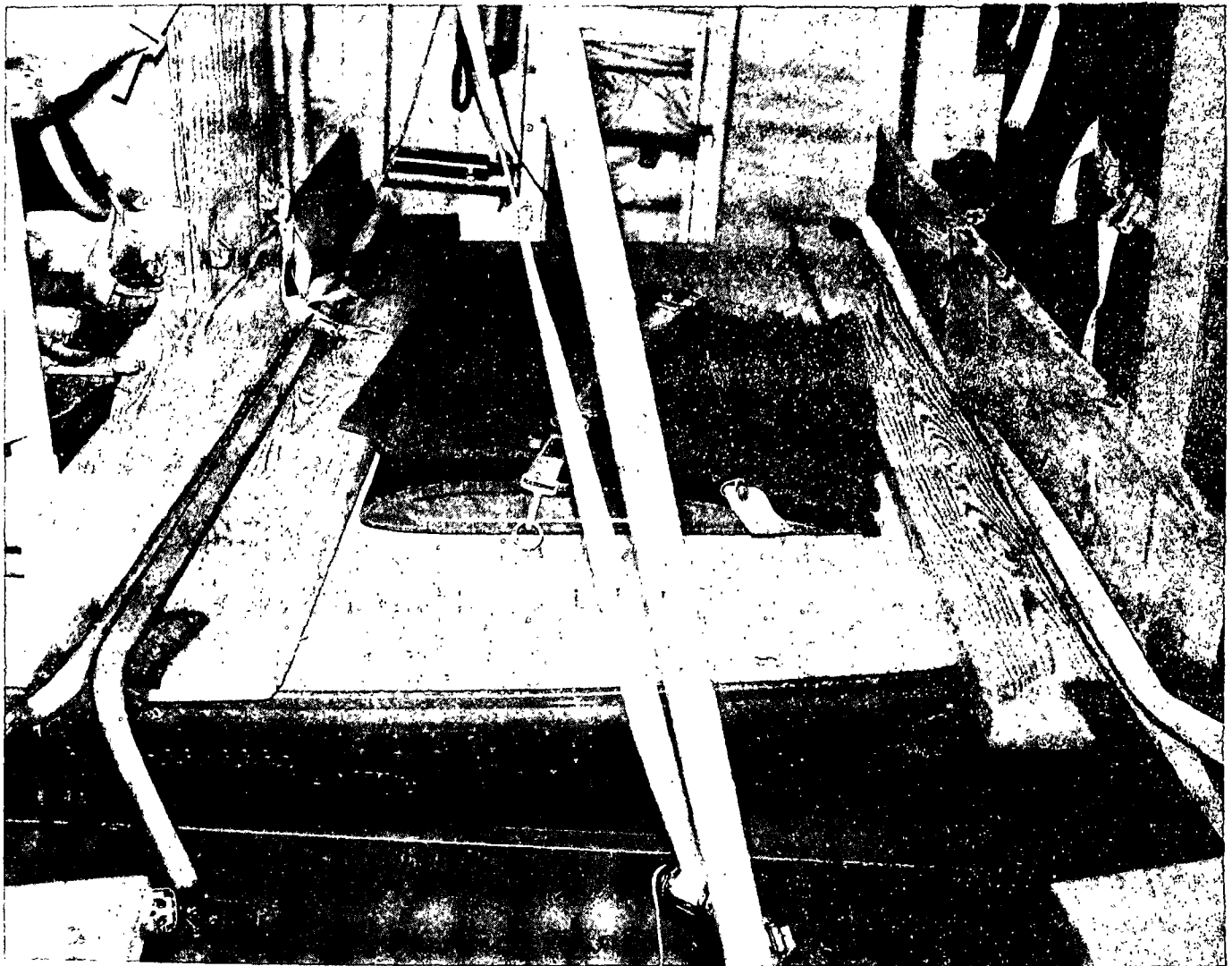
(5) Unhook the winch cable, remove the towing bridle, and manhandle the helicopter to its tiedown location onto the parking shoring, as shown in figure 5-7.

(6) Remove the ground handling wheels.

(7) Load the remaining helicopters in numbered sequence.

**Caution:** Use extreme care during loading to prevent contact with other helicopters.





*Figure 5-3. Tie down of the helicopter in the C-5. Note the construction and positioning of the tiedown beams, the felt sheets at the ends of the beams, and the method of tie down of the synchronized elevator.*

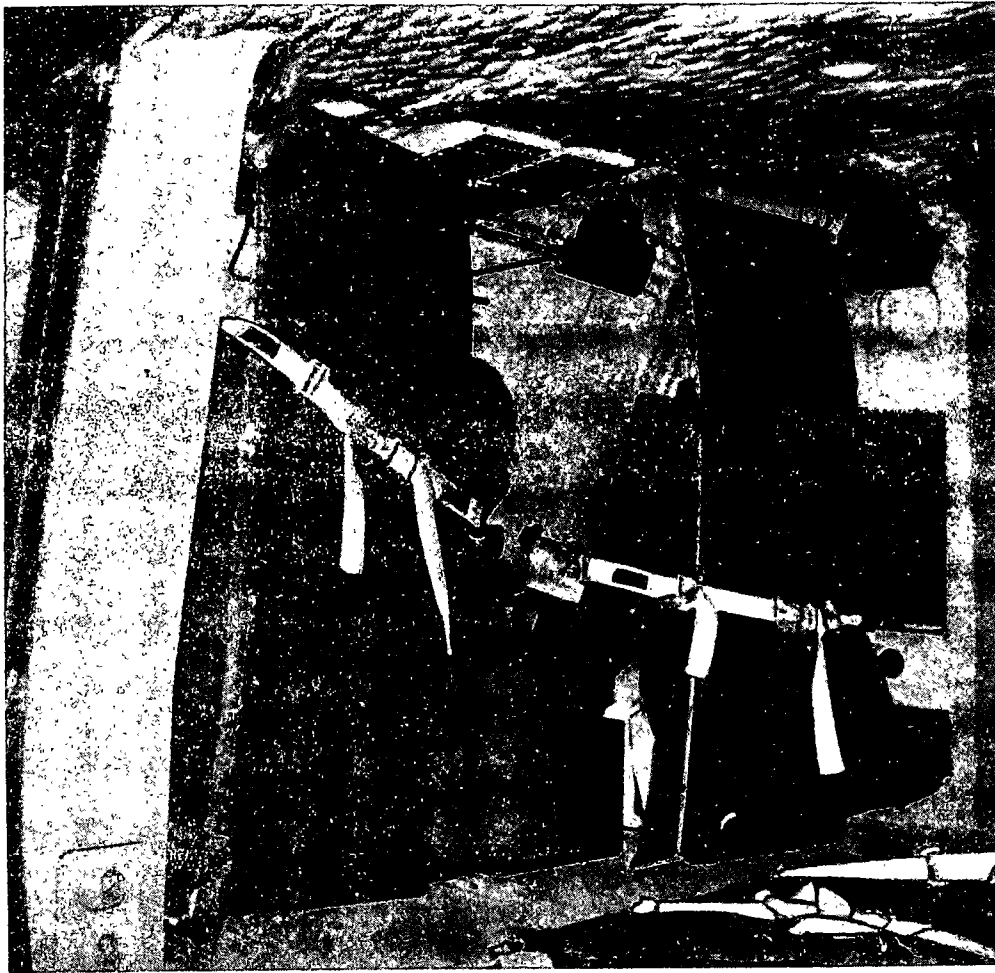
#### 5-4. Tie Down

##### *a. Materiel.*

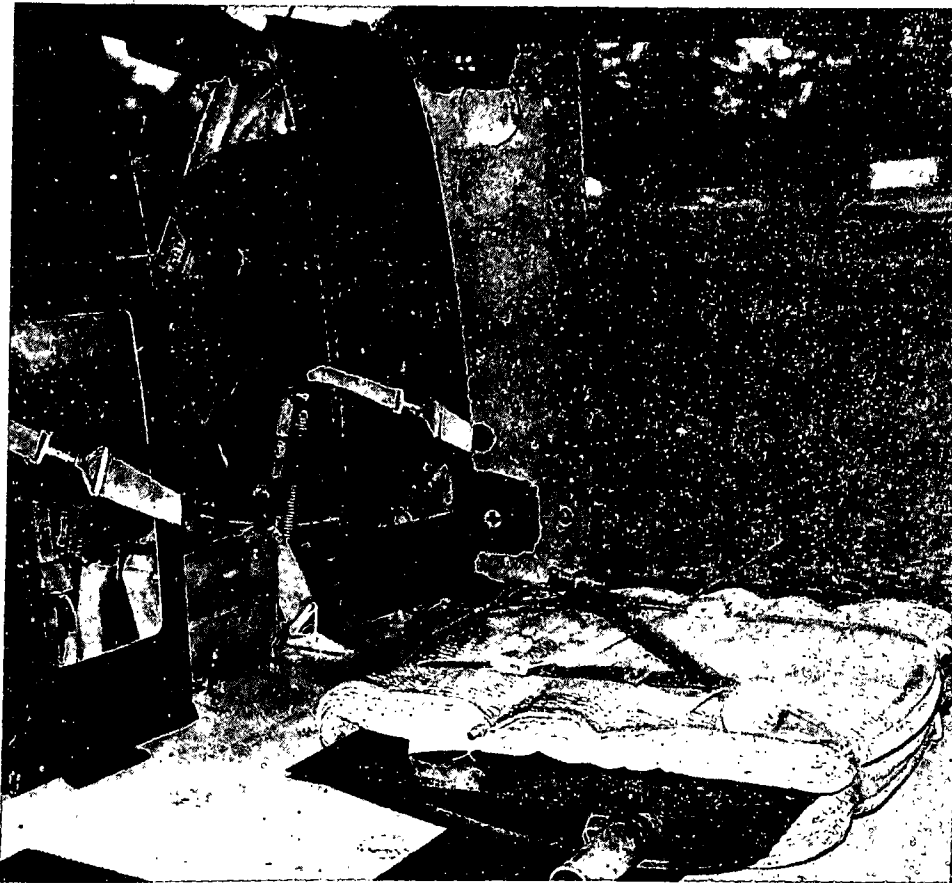
(1) A minimum total of 164 CGU-1B tiedown devices are required for tie down of seven helicopters. Twenty-three devices are required for tie down of one helicopter and one synchronized elevator. If devices are used to tie down other components, two to four more devices will be needed for each helicopter.

(2) Fourteen pieces of  $\frac{1}{2}$  - by 12- by 30-inch felt sheeting, used under the tiedown straps where they are wrapped around the rotor blades.

(3) Twenty-eight pieces of  $\frac{1}{2}$  - by 12- by 18-inch felt sheeting, used under the tiedown straps at the ends of the tiedown beams.



*Figure 5-4. Stowage and tie down of the forward cargo doors and one synchronized elevator in the helicopter. Note the felt sheet used for cushioning.*



*Figure 5-5. Stowage and tie down of the forward cargo doors, one synchronized elevator, FM antenna, and one stabilizer bar. Note the felt sheet and mattress used for cushioning.*

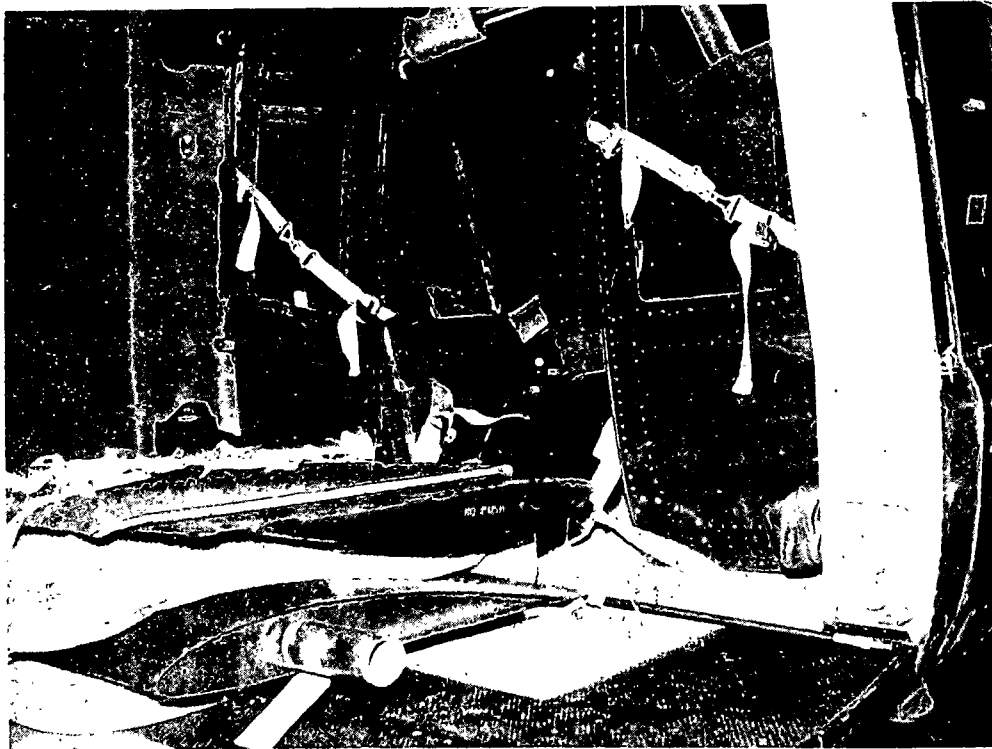
*b. Personnel and Time.* Eight men tie down one helicopter in 15 minutes.

*c. Procedure.*

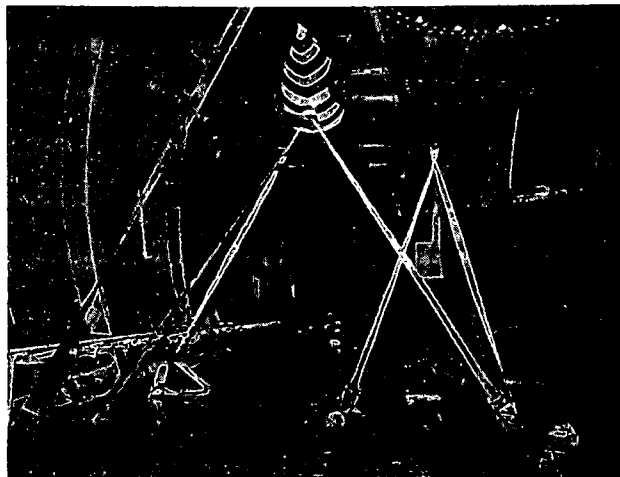
(1) Lay two tiedown beams across the floor of each helicopter cargo compartment as shown in figures 5-3 and 5-9.

(2) Tie down the helicopters as shown in figures 5-7, 5-8, and 5-9.

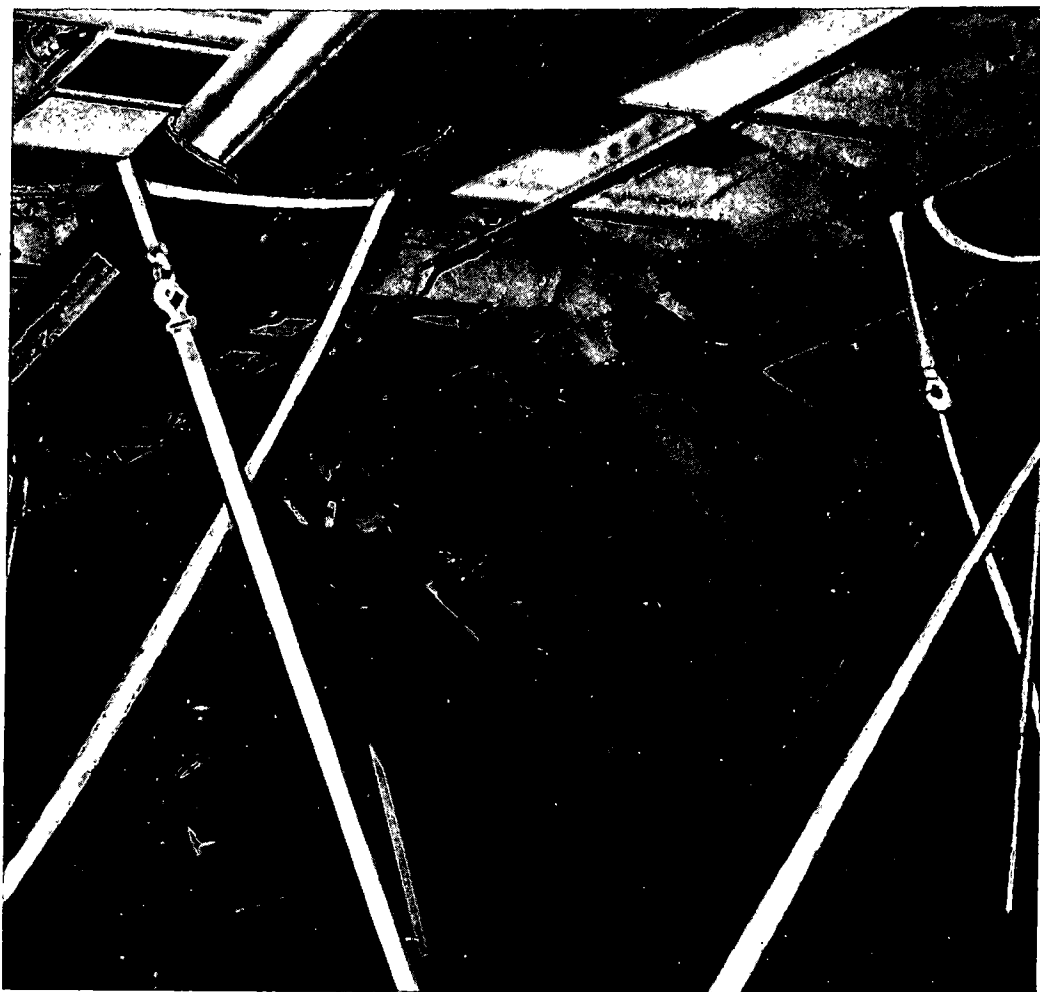
(3) Place one sheet of 12- by 30-inch felt under each tiedown strap where it is wrapped around a rotor blade, as shown in figure 5-8. Place one sheet of 12- by 18-inch felt under each tiedown strap where the strap passes over the end of a tiedown beam, as shown in figures 5-3 and 5-9.



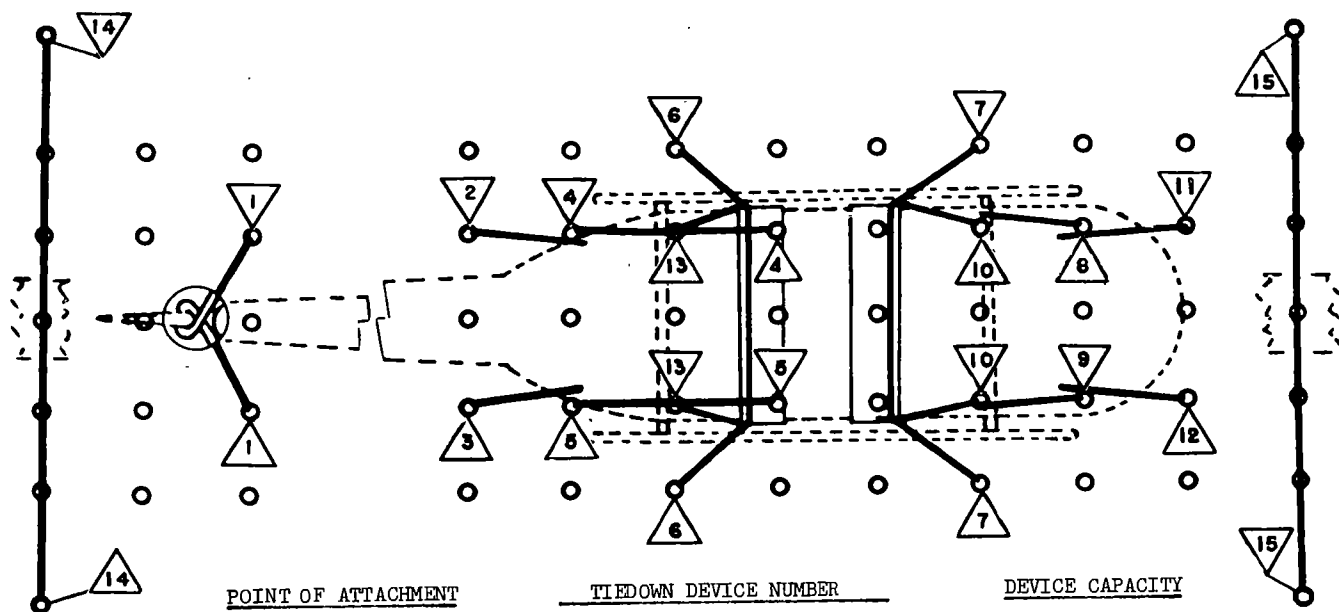
*Figure 5-6. Stowage and tie down of the forward cargo doors, two synchronized elevators, and FM antenna. Note the felt sheet and mattress used for cushioning.*



*Figure 5-7. Tie down of the helicopter in the C-5. Note the parking shoring under the skid tube.*



*Figure 5-8. Tie down of the helicopter in the C-5. Note felt sheet under the tiedown straps wrapped around the rotor blades.*



| <u>POINT OF ATTACHMENT</u> | <u>TIEDOWN DEVICE NUMBER</u>    | <u>DEVICE CAPACITY</u> |
|----------------------------|---------------------------------|------------------------|
| Tail skid                  | 1/1                             | 5,000 lbs              |
| Mooring rings              | 2, 3, 11, 12                    | 5,000 lbs each         |
| Cross tubes                | 4/4 (two devices, end to end)   | 5,000 lbs total        |
|                            | 5/5 (two devices, end to end)   | 5,000 lbs total        |
|                            | 8, 9                            | 5,000 lbs each         |
| Tiedown beams              | 13/13 (two devices, end to end) | 5,000 lbs total        |
|                            | 6/6 (two devices, end to end)   | 5,000 lbs total        |
|                            | 7/7 (two devices, end to end)   | 5,000 lbs total        |
|                            | 10/10 (two devices, end to end) | 5,000 lbs total        |
| Rotor blades               | 14/14 (two devices, end to end) | 5,000 lbs total        |
|                            | 15/15 (two devices, end to end) | 5,000 lbs total        |

Figure 5-9. Tiedown diagram and instruction for the helicopter in the C-5 airplane.

## 5-5. Unloading

### a. Materiel

(1) A minimum of two sets of ground handling wheels.

(2) Three MB-1 tiedown device chains for the towing bridle.

b. *Personnel and Time.* Eight men remove the

tiedown devices, install the ground handling wheels and towing bridle, and unload one helicopter from the C-5 in 15 minutes.

c. *Procedure.* Unloading is the reverse of loading, except the winch is used for braking the helicopter as it is manhandled down the C-5 ramp. Remove parking shoring from the C-5 as each helicopter is unloaded.

## APPENDIX A

### REFERENCES

---

#### A-1. Department of the Army Fields Manuals (FM)

- 21-5 Military Training.
- 21-6 Techniques of Military Instruction.
- 21-30 Military Symbols.
- 55-12 Movement of Army Units in Air Force Aircraft.
- 55-15 Transportation Reference Data.
- 57-35 Airmobile Operations.

#### A-2. Department of the Army Technical Manuals (TM)

- 1-UH1-S Preparation for Shipment of UH-1 Helicopters.
- 38-250 Packaging and Handling of Dangerous Materials for Transportation by Military Aircraft.
- 55-406 Fundamentals of Aircraft Powerplant Maintenance.
- 55-450-15 Air Movement of Troops and Equipment.
- 55-1520-210-10 Operator's Manual: Army Model UH-1D/H Helicopters.
- 55-1520-210-20 Organizational Maintenance Manual: Army Model UH-1D/H Helicopters.
- 55-1520-210-34 DS and GS Maintenance Manual: Army Model UH-1D/H Helicopters.
- 55-1520-210-34P-1 DS and GS Maintenance Repair Parts and Special Tools Lists: Helicopters UH-1B/C/D/H/M.
- 55-1520-219-10 Operator's Manual: Army Model UH-1B Helicopter.
- 55-1520-219-20 Organizational Maintenance Manual: Army Model UH-1B Helicopter.
- 55-1520-219-34 DS and GS Maintenance Manual: Army Model UH-1B Helicopter.
- 55-1520-220-10 Operator's Manual: Army Model UH-1C/M Helicopter.
- 55-1520-220-20 Organizational Maintenance Manual: Army Model UH-1C/M Helicopter.
- 55-1520-220-34 DS and GS Maintenance Manual: Army Model UH-1C/M Helicopter.

#### A-3. Department of the Army Pamphlets (DA Pam)

- 108-1 Index of Army Motion Pictures, Film Strips, Slides, and Phono-Recordings, and Related Audio Visual Aids.
- 310-1 Military Publications: Index of Administrative Publications (Army Regulations, Special Regulations, Circulars, Pamphlets, Commercial Traffic Bulletins, Joint Chief of Staff Publications, General Orders, and Bulletins).
- 310-3 Military Publications: Index of Doctrinal, Training, and Organizational Publications (Field Manuals, Reserve Officers' Training Corps Manuals, Training Circulars, Army Training Programs, Army Subject Schedules, Army Training Tests, Department of the Army Posters, and Firing Tables and Trajectory Charts).
- 310-4 Military Publications: Index of Technical Manuals, Technical Bulletins, Supply Manuals (Types 7, 8, and 9), Supply Bulletins, and Lubrication Orders.

## APPENDIX B

### RAMP EXTENSIONS

---

#### Section I. GENERAL

##### B-1. Purpose

Ramp extensions are positioned at the airplane ramp to change the helicopter loading angle for better clearance in movement into the cargo compartment. They also reduce the helicopter angle of ascent up the aircraft ramp and prevent the skids from scraping the ground or ramp.

##### B-2. Types

The ramp extensions and extension-toes described in this appendix are as follows:

a. *Extensions.* The three types are as follows:

(1) The folding wood extension (the folding extension).

(2) The three-section plywood extension (the plywood extension).

(3) The lumber extension.

b. *Extension-Toes.* Ramp extension-toes facilitate movement of the helicopter over the forward/aft edges of the aircraft cargo/auxiliary loading ramps and ramp extensions. The toes vary in dimension depending on the type of transporting aircraft and ramp extension prepared for the loading operation. The toes are made from ½-inch plywood boards of desired size nailed together. The toes are used during loading/unloading as shown in figure B-9.

*Note.* Each C-130 and C-141 aircraft is equipped with two auxiliary ground-loading ramps (auxiliary ramps). The ramps

hook into the aft edge of the aircraft loading ramps to provide a smooth rolling surface on which to move cargo onto or off the ramp. They must always be used to support the extension assemblies as shown in figures 2-6, 2-7, 2-8, and B-8.

##### B-3. Advantages and Disadvantages

a. *The Folding and Plywood Extensions.* The folding and plywood extensions have two major advantages over the lumber extension. They are usable with any Air Force transport aircraft and may be constructed in advance of the loading operation, then moved to the loading site by truck or forklift. It is not feasible to disassemble the folding extension other than to separate the sections by removing the hinge pins. If lightly nailed together, after loading is completed the individual sheets of the plywood extension may be separated from the other sheets in the sections, then used for shoring during transport. The sheets can then be reassembled for unloading the helicopters at destination.

b. *The Lumber Extension.* The lumber extension is used for loading/unloading helicopters into/from C-130 or C-141 aircraft only, and has to be assembled on site. After loading is completed, it can be disassembled and transported with the helicopter. The components may be used for shoring and reassembled for unloading the helicopter at destination.

#### Section II. THE FOLDING WOOD RAMP EXTENSION

##### B-4. Description

The folding extension consists of two identical assemblies. Each assembly consists of a ground section and a ramp section connected by hinges. Each assembly is 20 feet long, 3 feet wide, about 1 foot high, and weighs approximately 500 pounds.

##### B-5. Materials for Two Ramp Assemblies

a. Ten sheets of ½-inch by 48-inch by 8-foot plywood, AC exterior, for the ramp flooring, eight end boards, and four toe supports.

b. Eight pieces of 2-inch by 12-inch by 12-foot lumber, No. 2 common, for 16 stringers and 12 hinge plates.

c. Thirty-six pieces of 2- by 4- by 10-inch lumber for spacers between the stringers.

d. Twelve pieces of 2- by 6- by 10-inch lumber for spacers between the stringers.

e. Six strap hinges, minimum 4-inch pin and 12-inch strap length, for connecting the ramp sections.

f. Sixty screwhead bolts, ¼-inch shank and 3¼-inch length, for attaching the hinges to the ramp sections.

g. Nails, common, 8d, as required.

h. Nails, common, 16d, as required.



*Note.* For loads heavier than the UH-1 helicopter the extension may be strengthened by nailing on "bottom boards" as indicated in figures B-4 and B-5. Each bottom board is a plywood sheet  $\frac{1}{4}$  inch thick, 3 feet wide, and 8 feet long. If they are incorporated during the initial construction of the extension, it is unnecessary to remove the toe-waste portion of the stringers shown in figure B-2.

## B-6. Constructing the Assemblies

Cut and assemble the materials as shown in the illustrations below. Nail all materials securely. Attach the hinges to the sections. Stencil "RAMP" and "GROUND" on both sides of the appropriate sections of each assembly.

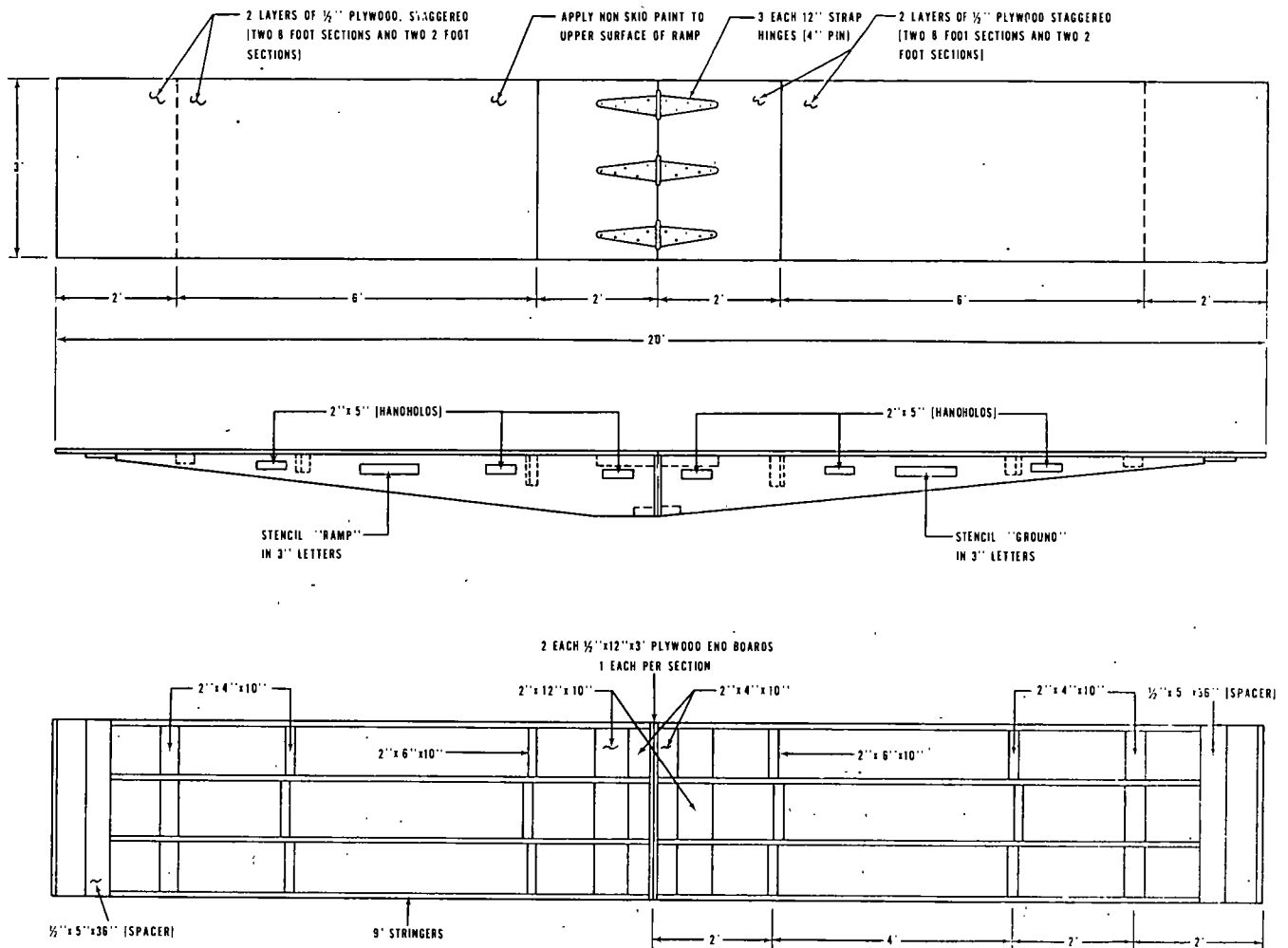
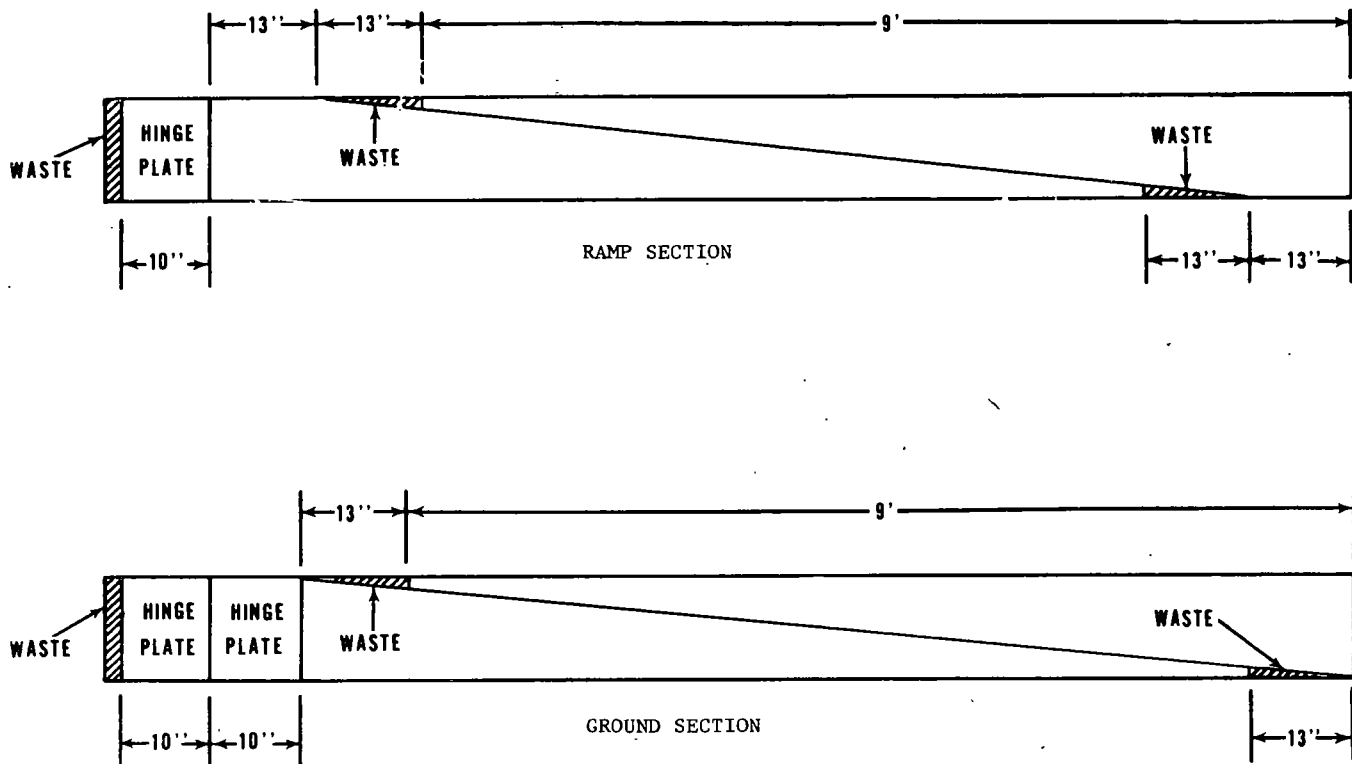


Figure B-1. Construction details of the folding extension.



**NOTE: SIX HINGE PLATES ARE CUT FROM THE ENDS OF THE STRINGER LUMBER.**

*Figure B-2. Cutting diagram for the stringers and hinge plates.*

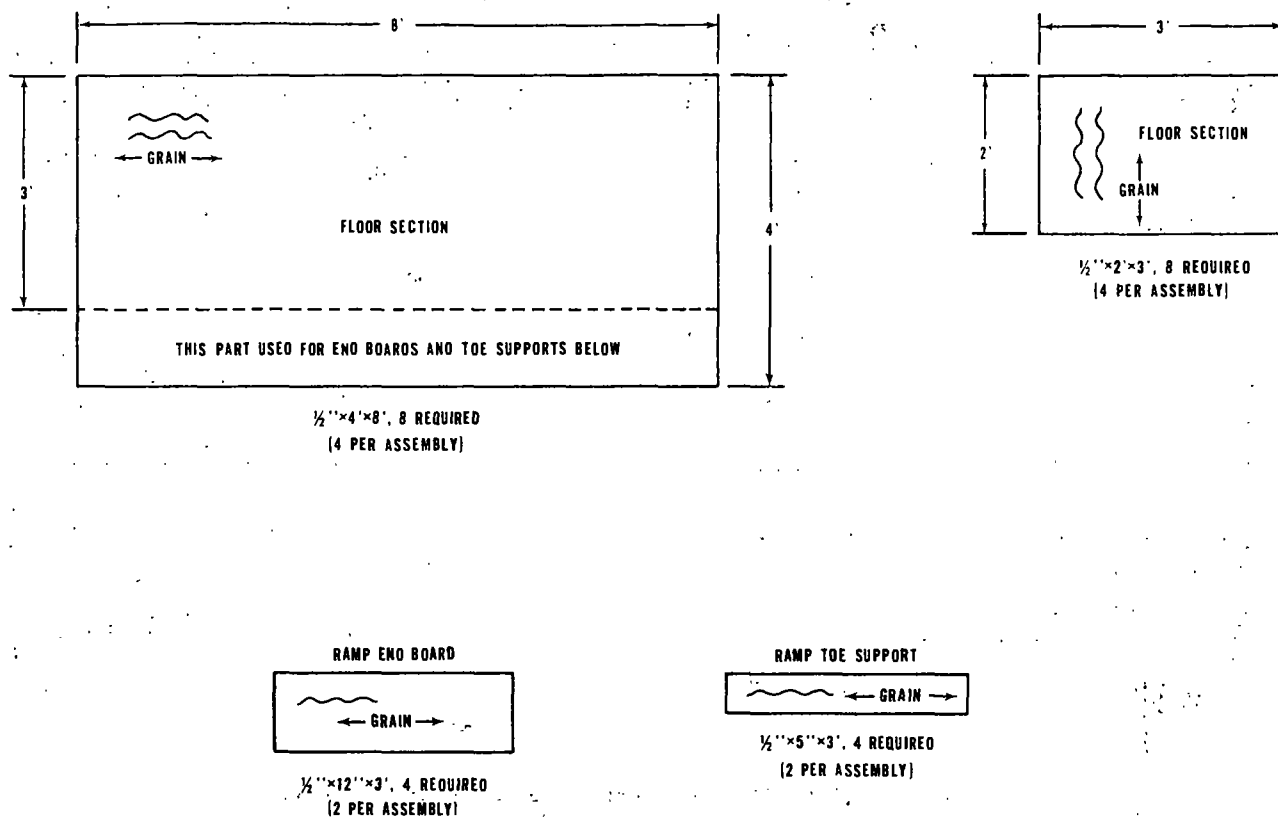


Figure B-3. Cutting diagram for the plywood floor sections, end boards, and toe supports.

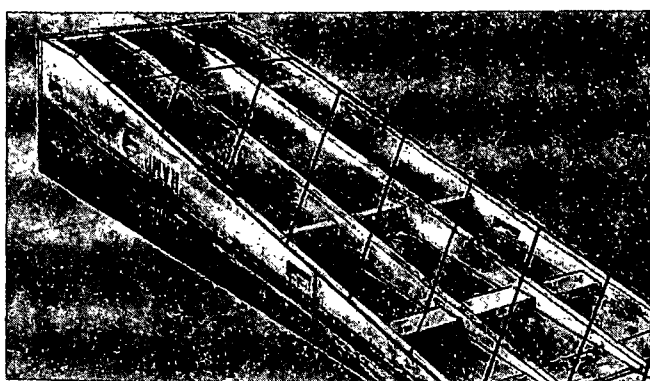


Figure B-4. Underside construction details of the folding extension. The crosshatched area shows where the "bottom board" is nailed to the underside of the ramp section to strengthen it for heavier loads. Note also the extension of the stringers to the end of the ramp.

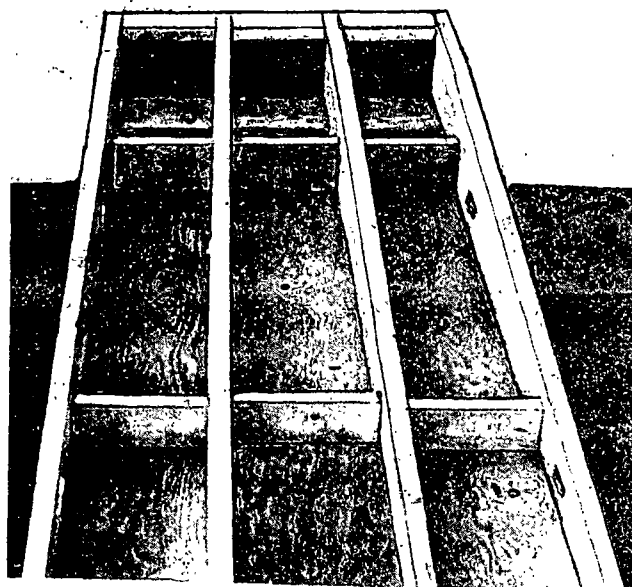
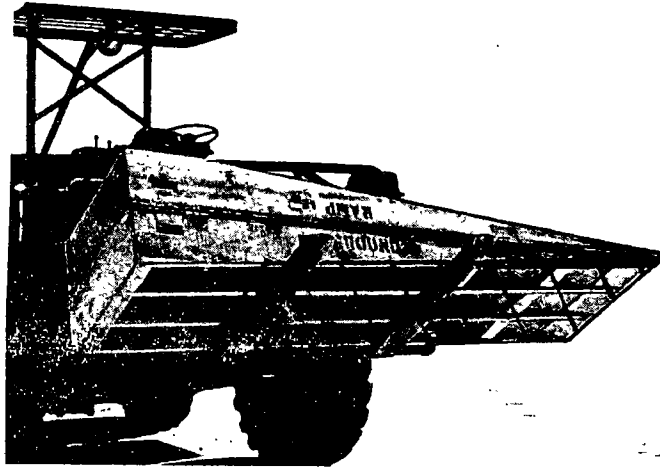


Figure B-4—Continued.



*Figure B-5. Moving a folding extension by forklift. Note underside components, particularly the plywood toe support. The crosshatched areas show where the "bottom board" is nailed to the underside ground section to strengthen it for heavier loads. Note also the extension of the stringers to the end of the ramp.*

### Section III. THE THREE-SECTION PLYWOOD RAMP EXTENSION

#### B-7. Description

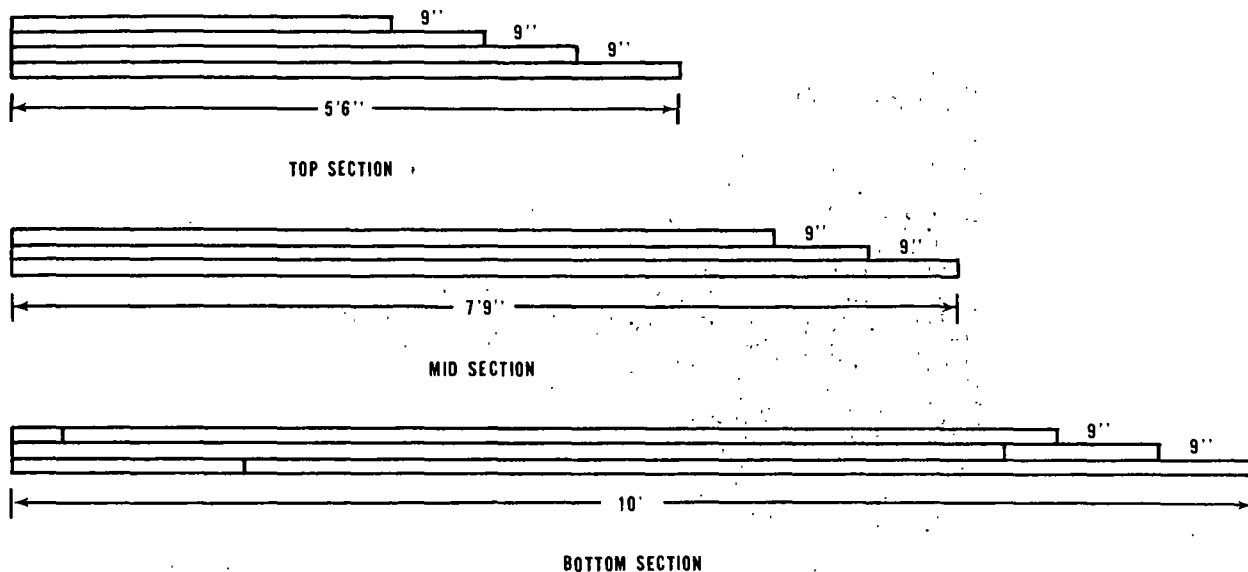
The plywood extension is constructed from  $\frac{3}{4}$ -inch thick plywood formed into two identical assemblies. Each assembly is composed of three separate sections, each 2 feet wide. Thus, there are three pairs of identical sections. The bottom section is 10 feet long,  $2\frac{1}{4}$  inches high, and weighs 120 pounds. The middle section is 7 feet 9 inches long,  $2\frac{1}{4}$  inches high, and weighs 70 pounds. The top section is 5 feet 6 inches long, 3 inches high, and weighs 60 pounds. For loading operations, the three sections stack into an assembly  $7\frac{1}{2}$  inches high that weighs 250 pounds.

#### B-8. Materials for Two Ramp Assemblies (Six Sections)

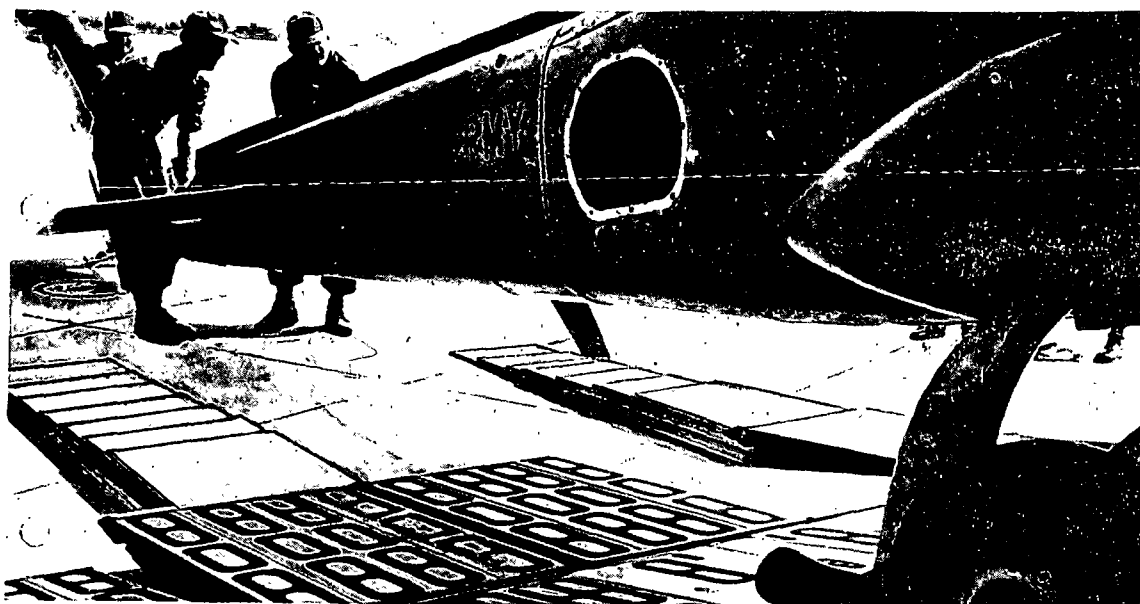
- a. Ten sheets of  $\frac{3}{4}$ -inch by 4-foot by 8-foot plywood, AC exterior.
- b. Nails; common, 16d, as required.
- c. Nails; common, 8d, as required.

#### B-9. Constructing the Assemblies

Use figure B-6 to cut and assemble the separate sections. First cut the 8-foot plywood sheets into strips 2 feet wide and 8 feet long. Next, cut the 2-foot strips into boards of the length indicated by the figure. Assemble and nail boards into the three separate sections as shown. *Do not* nail the sections to each other.



*Figure B-6. Dimensioned side view of the three sections of a plywood extension assembly.*



*Figure B-7. Loading the helicopter over the plywood extension into a C-5. Note that only two sections of each assembly are used.*

#### Section IV. THE LUMBER RAMP EXTENSION

##### B-10. Description

The lumber ramp extension (fig B-8) is constructed on site from boards and plywood. Two

identical assemblies are required. These formed after the aircraft is in position at the loading location.

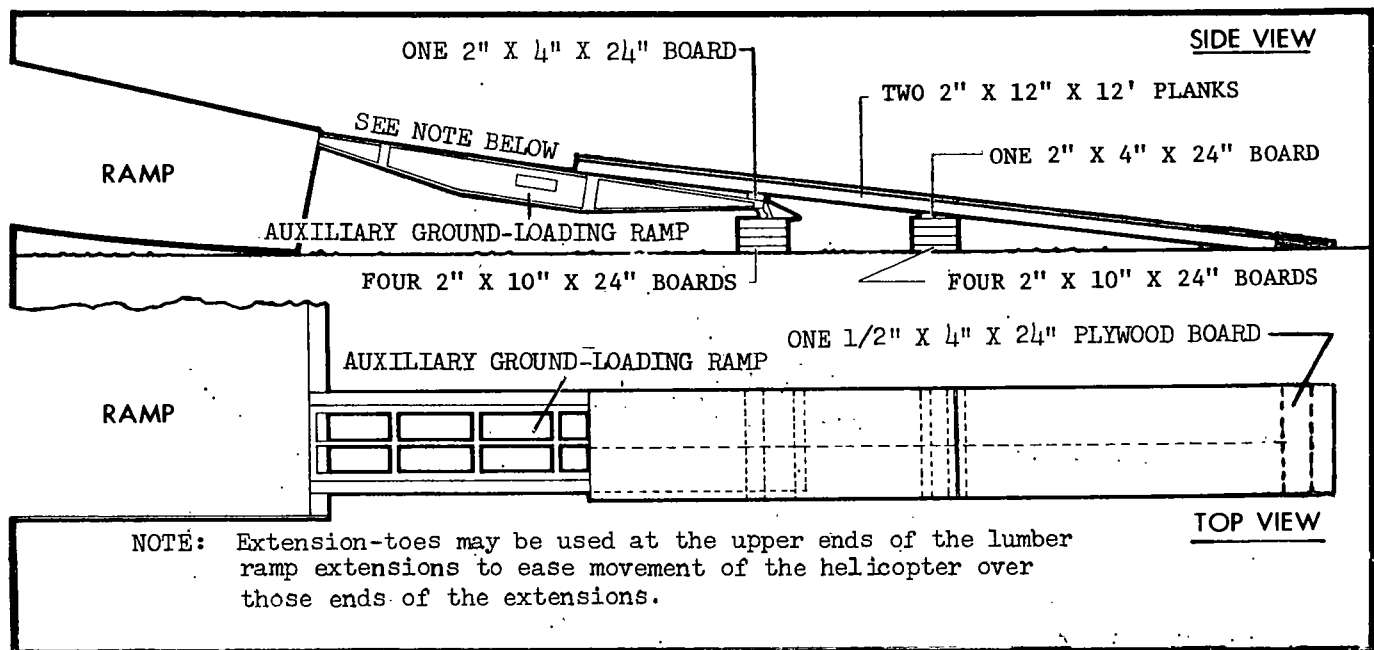
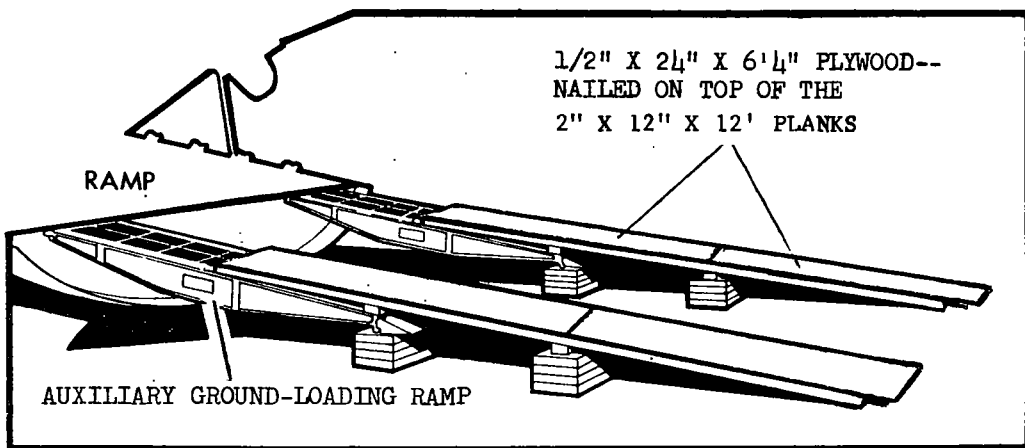


Figure B-8. The lumber ramp extension.

#### B-11. Materials for Two Ramp Assemblies

- a. Four 2-inch by 12-inch by 12-foot planks, No. 2 common, for the under-flooring.
- b. Four sheets of 1/2-inch by 24-inch by 6 1/2-foot plywood, AC exterior, for the top-flooring.
- c. Two pieces of 1/2- by 4- by 24-inch plywood, AC exterior, for the ramp extension-toe support.
- d. Four 2- by 4-by 24-inch boards for the smaller cross supports under the 12-foot planks.
- e. Sixteen 2- by 10- by 24-inch boards for the larger cross supports under the 2- by 4-inch cross supports.

- f. Nails, common, 10d, as required.

- g. Nails, roofing, large head, 1 1/4 inches long, as required, for fastening the plywood to the 12-foot planks.

#### B-12. Constructing the Assemblies

Cut and assemble the materials as shown in figure B-8.

*Note.* Do not overnail. The assemblies should be secure and rigid, but as they are to be disassembled after the helicopters are loaded, overnailing makes disassembly more difficult. Use two nails per board or plank where one board meets another. Eight roofing nails are adequate to hold one sheet of plywood to the 12-foot planks.

NOTE: Ramp extension-toes are constructed of 1/2-inch plywood. They will vary in dimensions, depending on the type of transporting aircraft and ramp extension used for loading.

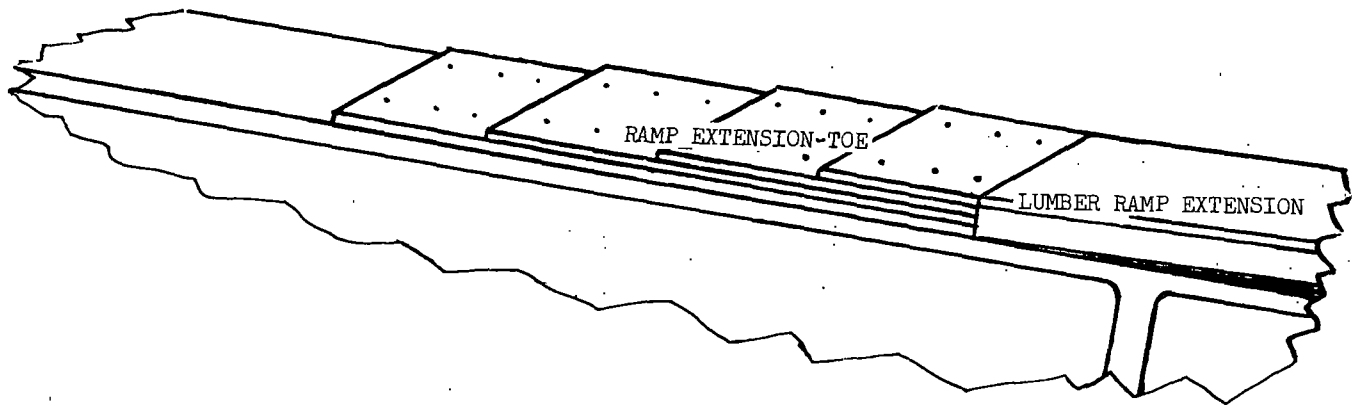


Figure B-9. Ramp extension-toe.

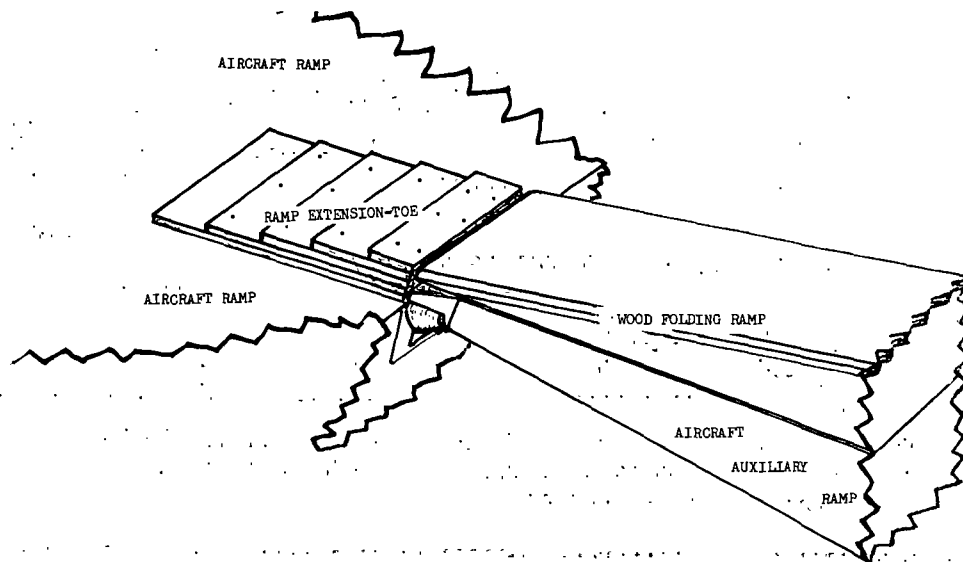


Figure B-9—Continued.



*Figure B-9—Continued.*



By Order of the Secretary of the Army:

FRED C. WEYAND  
*General, United States Army,  
Vice Chief of Staff.*

Official:

VERNE L. BOWERS  
*Major General, United States Army,  
The Adjutant General.*

Distribution:

To be distributed in accordance with DA Form 12-31 requirements for  
Operator and Crew for UH-1D and 1H Aircraft (QTY rqr block no. 351).

U.S. GOVERNMENT PRINTING OFFICE, 1974-603-170 / 5010

3000021394



**FM 55-14 AIR TRANSPORT OF SUPPLIES AND EQUIPMENT: UH-1 HELICOPTER  
IN AIR FORCE AIRCRAFT -- 1974**

PENTAGON LIBRARY



3000021394